

CAMERICAN INEMATOGRAPHER

The Motion Picture CAMERA Magazine

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this issue

Controlled Miniature Enlarging
Mechanical Engineering in Lenses
Cine News Photography Is Different
... and Other Features

for the amateur

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
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Volume XIII OCTOBER, 1933 Number 6

What to Read

Cover Photo by Elmer Dyer

Taken with a Graflex at f-27.5 of a
second lens opening F-4.5 on Agfa
Super Pan with an F.29 Filter

LIST of Members of A. S. C.	209
ENGINEERING applied to Lenses by William Taylor, O. B. E.	210
SENSITOMETRIC Control in Processing by Emory Huse, A. S. C.	212
CONTROLLED Printing for Miniature Negatives by Jackson Rose, A. S. C.	214
SPECIAL Effect Use of Filters by Hartley Kurnison	215
CINE News Photography is Different by George J. Lancaster, A. S. C.	216
NEW Studio Recording Head	218
WHEELS of Industry	220
RECENT Patents	253

Next Month

● Next Month we start a new series of Articles by Emory Huse. Mr. Huse will treat on an intensely interesting phase of picture making. There will be another installment of Mechanical engineering in the manufacture of lenses. More about the News man by George Lancaster. And other features of timely and technical value.

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Why **GENERAL ELECTRIC** developed *this new style high wattage lamp*



OLD TYPE 5 KW LAMP



NEW TYPE 5 KW LAMP

WHEN the electricians shift lighting equipment from place to place on the set, the lamp in each reflector is inevitably shaken and jarred. This snaps the filament about as if it had been struck with a mallet . . . or were the end man in crack-the-whip.

What takes the shock of these blows? Suppose we follow on the diagram, the complex path they travel through the supports of one of the old type 5 KW lamps. Down multi-jointed supports into a brittle glass stem, up through basing cement and then down to the prongs . . . with leverage and weakness increasing all the way. At any one of eight points, a break may occur, bringing premature lamp failure.

The movies brought a tough life to this lamp—tougher than any previously known. But G-E scientists, alert to motion picture requirements, began work on a lamp that could live it. They tried stems of different kinds of glass. They tried other experiments. The lamps were improved, but not enough. Gradually these experimenters reached one conclusion: great improvement would result only from the elimination of the glass stem . . . a part of lamp making since the days of Edison.

To accomplish this they turned to the method of fusing copper and glass developed in making a 50 KW lamp for Light's Golden Jubilee. But a year and a half of intensive experiment and test, without a single let-up, went by before G-E made this new 5 KW lamp available to you. In this new type construction, as the diagram shows, the channelled nickel filament support takes almost a straight line from filament to prongs. Stronger, more rugged, more accurate and better adapted to studio needs, this new lamp has been rapidly adopted by studio after studio.

Improving existing types of lamps constitutes only part of G-E research. Other groups of scientists and engineers are steadily developing new lamps for new requirements. Still other groups constantly test and check a definite proportion of factory production on all types of lamps. Such work breeds confidence. Little wonder that studios from coast to coast use G-E Mazda lamps for all their lighting needs. General Electric Company, Nela Park, Cleveland, Ohio.

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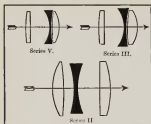


Fig. 1 Three Lens Systems
Aperture F 1-5.5

NEARLY every modern productive industry depends upon the use of machinery or tools which embody principles of mechanical science. In this sense almost all industry is based upon mechanical engineering; and that is why the knowledge and interests of the members of the Institution, who are the tool-makers for all industry, are so exceptionally varied.

Thinking that it would interest you more than would any other subject within my knowledge, I shall speak in this Address on the application of mechanical engineering to the production of lenses, particularly photographic lenses.

One of the characteristics of that industry is the extraordinary accuracy regularly attained in its best products. One-thousandth of an inch is approximately the limit of accuracy which can be attained in the ordinary machining of metal with cutting tools. One ten-thousandth of an inch represents the order of accuracy generally attainable in such work by grinding or lapping; for example, in the work of the fine tool-maker and the watchmaker. Here are two knife-edge gauges, made to demonstrate to the King and Queen these dimensions of one-thousandth and one ten-thousandth of an inch. Each comprises a hardened and lapped straight-edge and a piece of steel, hardened and lapped to a plane and placed over the knife-edge, so that light can be seen through the gap between them. The one gauge has a gap of 0.001 inch and the other of 0.0001 inch. The latter is the highest order of accuracy attained regularly in any manufacturing industry excepting perhaps the optical industry alone. But in making the best photographic lenses and other optical instruments of precision, the accuracy of the surfaces of the elements (such as lenses, prisms, and mirrors) must be from 0.00001 to a few millionths of an inch (measured in wavelengths of light), and this accuracy is attained in everyday working not only by skilled artist craftsmen of long experience but by less skilled persons doing repetition work by the aid of special appliances, the products of mechanical engineering.

When I entered the optical industry some forty-five years ago, after training as an engineer, I was greatly impressed by the primitive methods then in use and the wonderful work done by a few artist craftsmen. Alvan Clarke, who constructed the great telescope objectives of the Lick and Yerkes Observatories, appeared to have no tools much more elaborate than those one could find in a country blacksmith's shop. But the product of the artist craftsman

Mechanical

is expensive and its quality inevitably varies with the craftsman. It may or may not be really good, and the quality is rarely upheld and ensured by complete and independent inspection. These things were true, for example, of the old English hand-made watch.

Before describing how the production of lenses, such as those used in photography, has been lifted from the level of a somewhat primitive craft towards that of a science, and put, as Sir Charles Parsons expressed it, upon a mechanical engineering basis, I must briefly describe in a very general way the characteristics of such lenses.

The Designing of Photographic Lenses.—The function of a photographic lens is to form real images of objects by receiving light from each point of the object, and condensing it to a corresponding fine point properly located in the image.

The problem of satisfying this simple statement in designing the best photographic lenses is exceedingly complex. No true mathematical solution is known nor perhaps ever will be. The only really perfect optical instrument is the plane mirror. The work of photographic lens design is

Fig. 5. Group of Finished Lenses. All from Fig. 7. Typical pieces of raw glass also.



Engineering Applied to Lenses

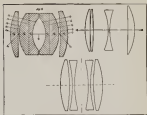
by

William Taylor, O. B. E.*

scientific, that is, based upon the conscious application of principles of physics and mathematics, but in its most interpretations it is an art, based on tradition and upon habit gained by experience.

There are few first-rate artist-scientists of this kind in the world, men who, having a clear statement of each problem, perceive by instinct, nourished by experience, the main direction in which the solution must be sought. These pursue it by laborious mathematical work, sometimes for months, securing a first approximation, determining its deviation, and correcting their course accordingly, again by a mixture of art and science.

And of these few men it may be truthfully said that the best are Englishmen. For during the last twenty years nearly



Upper left Fig. 3 and upper right Fig. 4. Both apertures 5-1. Lower center Fig. 2. Lens System for Photography from distant. Apertures 5-4.5.

Fig. 4. Large Lens for Photographing star fields.



every single important advance in this field, nearly every step in providing faster lenses and better definition, has been made in England!

A perfect photographic lens would—

- receive a large amount of light from the object,
- condense to a mathematical point all the light which it received from each mathematical point of the object,
- arrange the image points in correct order and relative positions so as to render the image a true visual replica of the object,
- set all points of the image in one plane (for photographs must generally be flat),
- illuminate all points of the image correspondingly with those of the object.

It is physically impossible to devise a lens which has all these virtues simultaneously.

Consider a solid sphere of any transparent homogeneous material such as glass. That would act as a lens, and have this one supreme virtue, that it would present the same aspect to all points of the object alike and would both arrange the points of the image in correct relative positions along any given radial line, and illuminate each strictly in proportion to that of the corresponding point of the object. But unfortunately a solid spherical lens would not form a flat image of a flat object or a distant scene, but one curved spherically, nor would any point of the image be sharply defined, and this for two reasons,—

- (1) No single lens, of whatever shape, can focus, simultaneously, light of different wavelengths.
- (2) The wave fronts after passing such a lens would no longer be spherical but deformed, and, unless they be spherical, they cannot converge to mathematical points.

These two defects are respectively termed chromatic and spherical aberration. To cure them necessitates the use of at least two glasses of different compositions such that the relative velocities of light of different wavelengths are substantially different in the several glasses, the forms of the lenses being adapted to these properties of the glasses.

Lenses formed in this way, of two glasses commonly suffice for the objectives of telescopes, whose angle of view rarely extends to 10° and whose apertures are generally about one-twelfth the focal length (1-12).

But with the best photographic lenses the angle of view sometimes reaches 100°. Apertures have now reached f-1.3, and such lenses must be substantially free from distortion and image curvature, chromatic and spherical aberration, astigmatism and coma (these being varieties of spherical aberration affecting light passing obliquely to the

(Continued on Page 240)

POSITIVE CONTROL DATA

FROM the standpoint of positive control the procedure followed is very similar to that described for negative film. The final positive print contains both picture and sound track records. It is important from the standpoint of the sound that positive gammas be specified and maintained. For that purpose rigid control is applied to positive film development so that the predetermined positive gamma may be maintained consistent throughout. This is particularly true in release print development.

At another major studio laboratory control data have been obtained for a period of one day. This laboratory submitted all of their data on positive control for March 26, 1993. This consisted of each individual sensitometric curve for every machine in operation during that day at intervals of about one hour. During the day's work there were five developing machines in operation, each machine having in its system the same chemical formula. At this laboratory a positive control gamma of 2.00 is desired. By preliminary sensitometric tests, which consist of the development of Type 11b positive sensitometer exposures on the positive film emulsion which is in use, gamma determinations are made before any production work goes through. With these data it is possible to determine the time of development to give this desired gamma value. This time is controlled by the machine speed. In Figure 7 is shown a typical positive H and D curve giving an approximate gamma of 2.00 as obtained at this laboratory in one of the machines on the day in question. From this graph the general density range covered by the sensitometric strip, as well as the general shape of the curve, is readily seen. Once the time is determined to give this desired gamma, production starts and hourly thereafter a pair of sensitometric exposures are sent through. Each strip is then read for density and plotted. Upon the completion of the work a final curve is obtained showing gamma plotted against the time interval of development. Naturally there are some tests which show values greater or less than the desired value. Certain tolerances are, of course, allowed, usually a plus or minus .05 deviation from the normal. In the data which are presented in Figure 8 the actual variations are readily observable for each machine. The work during this day was not representative either of a good or a bad day but did show a perfectly average set of conditions. For any given machine for example machine No. 8, there is only a .06 maximum variation between the highest and lowest gamma strips. If all of these values of gamma were averaged a numerical gamma of 1.995 would be obtained. The maximum deviation, considering all machines, was only .07.

In the event that any general trend is shown by successive tests, then slight alterations are made in the actual time of development to compensate for that trend. It is the function of the foreman in charge of the positive developing machines to maintain the desired gamma of 2.00. From the data presented from this laboratory it can be seen that the results are excellent.

At this point it should be cited that similar conditions prevail in all of the laboratories in the Hollywood area and particularly those doing release printing. However, the purpose of this paper is to cite the sensitometric routine in vogue and to show the results obtained and it is fair to state that the results shown from this laboratory on their positive film control is indicative of the type of work obtained by all of the laboratories in Hollywood.

As was the case with negative developer formulas, a similar condition of difference exists from the standpoint of positive formulas. To complete this section on positive film control the tabulation of an average positive formula is considered necessary. Table 5 gives such a formula.

Sensitometric

TABLE 5
Positive Control Formula

Elon	12 ozs.
Sodium Sulphite	40 lb. 8 ozs.
Hydroquinone	4 lb. 14 ozs.
Sodium carbonate	26 lbs.
Potassium metabisulphite	1 lb. 7 ozs.
Potassium bromide	10 ozs.
Potassium iodide	178 grams
Water to	120 gallons

SOUND CONTROL DATA

A complete discussion of the sensitometric control for sound film development would be extremely voluminous. In the discussion of this subject in this paper no attempt will be made to give actual data from any individual studio. The control methods are similar to those described for positive and negative film but are much more detailed in many respects.

There are at the present time two major sound recording methods in vogue, the R. C. A. and the Western Electric systems. A brief discussion is necessary for each of these two methods. They differ appreciably and should be discussed separately. The R. C. A. system makes use of a variable area sound track, while the track of the Western Electric system is of the variable density type.

VARIABLE AREA

The particulars regarding this system of sound recording are very well known and this paper will give only the necessary details to describe the sensitometric requirements which are submitted to their licensees by the R. C. A. Victor Co. They are quite simple and are readily maintained in the processing laboratory.

The specification laid down by R. C. A. Victor engineers for negative gamma is that the negative sound track should be developed to give a control gamma of from 2.00 to 2.20. The unmodulated track density, and in this instance reference is made to the symmetrical track, should fall within the density range of 1.40 to 1.50. The sensitometric setup necessary to follow these specifications requires that the laboratory determine the time of development on the film being used for the recording to give a gamma within the limits just prescribed. It is then necessary for the recording unit to provide an exposure which will give a density upon development within the density limits cited above. R. C. A. Victor recommends for positive control gammas between 2.00 and 2.20, similar to the negative, while the positive track densities should be from .15 to .20 less than the negative density. For example, if the negative unmodulated track density at the proper gamma is 1.45, then the positive track density should be within the limits of 1.25 to 1.30. Naturally, during the course of processing, solution control must be maintained, and this is accomplished in a manner very similar to that previously described under positive film. Once the set of sensitometric conditions are determined, both from the exposure and development standpoint, then it is the function of the laboratory to maintain those conditions in their developing procedure. The developer normally used for this type of work is the regular picture positive formula, an example of which was cited under the heading of positive film.

Control In the Processing of Motion Picture Film

by

Emory Huse, A. S. C.*

Editor's Note: This is the concluding article in the series written by Emory Huse, A. S. C., on Sensitometric Control in the Processing of Motion Picture Film. In November Mr. Huse will start a new series of articles written in his usual instructive style.

VARIABLE DENSITY TRACK

In the consideration of the Western Electric system of recording a much more detailed systematic discussion is necessary. In processing variable density sound records which utilize the straight line portion of the H and D curve, it is necessary that the overall gamma characterized as determined by plotting projection densities versus the logarithm of light valve openings be held to the ideal value of unity. This might also be expressed by saying that the product of the positive and negative gammas multiplied by the projection factor should be 1.00.

Before specifying numerical values for positive and negative gamma, several factors entering into this computation must be explained. The gamma value obtained from a series of exposures on a light valve recorder and plotted against the logarithm of the light valve openings will be designated as the light valve gamma, $LV\gamma$. The gamma value obtained on the control strip which has been exposed on the Type 11b sensitometer and developed with the light valve gamma strip will be called the negative control gamma and designated as $C\gamma$.

In the measurement of positive gamma it is necessary to measure the apparent printer gamma, which is obtained by printing the negative control strip on a printer and developing this print with the positive sound track print. This value will be called $AP\gamma$. When the positive sound track print will be developed the positive control strip which has been exposed on the Type 11b sensitometer and the gamma value obtained on this strip will be designated as $PC\gamma$.

Further, inasmuch as the positive sound track in projection will be scanned by a photo-electric cell, it is necessary to determine experimentally the difference in gamma as determined by visual measurement of the diffuse densities and the specular measurements of the photo cell. This factor has been measured for standard projection conditions and found to be 1.30.

The conditions for correct reproduction as recommended by representatives of the Electrical Research Products, Inc., are given in the following series of data:

$$\text{Overall gamma} = LV\gamma \times AP\gamma \times \text{projection factor} = 1 \quad (1)$$

$$\text{If } LV\gamma = a \text{ and } NC\gamma = b \quad (2)$$

$$AP\gamma = b \text{ and } PC\gamma = c \quad (3)$$

$$\text{Overall } \gamma = NC\gamma \times PC\gamma \times a \times b \times \text{projector factor} \quad (4)$$

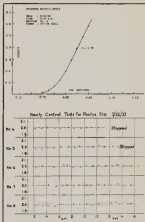


Fig. 7 at top.
Fig. 8 at bottom

It is customary to assume that the factor $a = 1$, i. e., the difference between the negative control gamma and the light valve gamma is negligible. In practice the light valve gamma is found to vary by plus or minus 5% from this. The printer factor, b , is usually measured daily in most laboratories, at least such a procedure is recommended. While the printer factor may be as much as 10% it is found in practice that this value is approximately equal to the factor, a , and opposite in direction so that the two tend to cancel each other.

Omitting these factors then from equation (4) we have Overall gamma $= NC\gamma \times PC\gamma \times \text{projection factor}$ (5)

$$\text{and substituting} \quad 1 = NC\gamma \times PC\gamma \times 1.30, \text{ or} \quad (6)$$

$$NC\gamma \times PC\gamma = 0.76 \quad (7)$$

In other words, any combination of negative and positive control gammas which gives a product approximating 0.76 would be correct for straight line recording.

Tests have been made in four Hollywood studios, which are listed by letter, of the actual Type 11b sensitometer negative and positive gammas. In Table 6 these data are given.

Studio	Negative Gamma	Positive Gamma	Visual Product
A	.42	2.10	88
B	.35	2.15	75
C	.36	2.00	72
D	.38	2.40	91

It will be observed that the maximum variation from 0.76 is 0.15 higher. One studio at the time these tests were made operated slightly lower than the desired 0.76, their visual product being 0.72. A mean exposure of the light valve that will permit 90% modulation without going into the toe of the negative H and D curve is recommended. This results in an average density numerically equal to the

(Continued on Page 238)

Controlled Printing for Miniature Camera Pictures

by

Jackson J. Rose, A. S. C.

Editor's Note: The article inaugurates a new department in the *AMERICAN CINEMATOPHILE*, a series of informal discussions of miniature camera practice, which will be conducted by A. S. C. members.

THE other day I happened to take a group of my 11x14 salon prints to the studio with me. I'll admit that I'm rather proud of some of them, and I was naturally glad to show them to some of the other people on the set. Finally Lionel Barrymore (who, though it is not generally known, is as fine a pictorial photographer and etcher as he is an actor), after studying them over for some time, asked me what sort of a camera I had used to make them with. When I replied that I had made them with a miniature camera, he was astonished, "I use a miniature camera myself," he exclaimed, "and I've gotten some fine results with it—but nothing like these prints. Would you mind telling me how do you do it?"

Of course I didn't mind; there's really no secret to it, for the methods I have used are simply the same controlled-printing methods that every pictorial photographer uses. More work is involved, of course, but the ultimate results justify it and the method is particularly applicable to the needs of the miniature-camera user. Now, just as the outstanding advantages of using a miniature camera are the facts that you have an extremely small, yet high-grade photographic machine, capable of making a large number of negatives for a negligible cost—yet negatives which are capable of extreme enlargements—the miniature camera suffers from one outstanding disadvantage, in the fact that its negatives are so small that any retouching or such modification is practically impossible. Yet, if you care to go to a bit of extra trouble, you can control or modify a miniature-camera negative quite as accurately as you can a larger one.

In any miniature-camera work, of course, you have an almost infinite variety of negative-materials to choose from—Orthochromatic, Semichromatic, Panchromatic, SuperSensitive, and fine-grain Panchromatic, from half-a-dozen or more manufacturers. Likewise, you have a wide variety of negative-developers from which to choose. In any sort of miniature-camera work, clearly, the wisest course is to choose the combination of film and developer which your experience has shown you will give you the best results.

Once you've made your exposures and developed the



All top: controlled print of 11x14 enlargements; **bottom:** enlargement from original 16x16 negative.

negatives—all in the usual manner—you'll have a roll of film with thirty or forty pictures on it; obviously, the next step is to decide which of these pictures are merely routine pictures, and which you want to concentrate on for their pictorial or other possibilities. Once you've made this decision, the real work begins.

Here you have a negative, 24x36mm., which is essentially what you want—at least, it shows the subject pretty much as you want it, the right angle, composition, exposure, filtering, etc.; and it is of reasonably good technical quality. Very well! What can we do to get a really perfect enlargement out of it? Let's see: here is one of those little scratches that somehow get into the most carefully-handled films, there is a spot where the contrast-balance could be improved; and how it would improve the picture if we could do a little retouching at this point!

So let's make the very best enlargement from this negative that we can. Use the best possible enlarger, and your favorite 8x10 glossy bromide-paper. For the best results, I'd make a glycerin sandwich out of the negative; put it

(Continued on Page 237)



Above—Relative values as interpreted by the naked eye; Below—relative values as interpreted on Panchromatic film.

Special Effect Use of Filters

Part IV

by

Hartley Harrison

Editor's Note: This is the fourth in the series of articles on this subject by Hartley Harrison, well-known manufacturer of color and effect filters.

WE HAVE seen from the discussion in the previous article that the manner in which we wish to control or change the relative contrast of the various colored objects in the scene determines broadly the density of the filter. However in determining the exact density necessary to give the change of relative contrast that is wanted, some filter measuring device is highly desirable. It eliminates to a large degree the guess work in the final selection of the filter.

One of the simplest means of doing this is to use a panchromatic viewing glass that will compensate for the difference between the color sensitivity of a normal eye and that of the film that is being used.

As these are a great many types of viewing glasses we will explain the type that is referred to as panchromatic

viewing glass and explain its application relative to measuring color filter densities.

Also let me add that the panchromatic type of viewing glass has been on the market for several years and is made by several different manufacturers.

There has been a great mass of information written on the subject of the difference between the color sensitivity of a normal eye and panchromatic film, but we will only touch on the high lights of these differences as they relate to measuring the exact density of a color filter necessary to create the desired change of relative contrast when using a viewing glass.

As the color of the various objects in the scene determines the amount of light, within certain general limits, that is being reflected from the objects, and as the film does not have the same sensitivity for each different color, the viewing glass, in order to allow a person to see the relative contrast of the various colors must, first transmit all of the colors, second, transmit the colors in the proportions to which the film is sensitive to the various colors, and third compensate for those colors to which the eye is more sensitive.

Or in other words if we photograph wedges of blue, green, yellow and red with panchromatic film as shown in Figure 1, and each reflects the same amount of light, only of a different color, we will find that the blue wedge is the lightest, the green the darkest, and the red and yellow have a density between these two. But looking at the colors visually the yellow will be the lightest, the blue the darkest and the red and green will have a density that is in between the two, as shown in Fig. 2.

Therefore the viewing glass when viewing the same colors through it should compensate for those differences and make the blue appear the lightest, the green appear the darkest and the red and yellow in between, exactly the same as the film will photograph the colors.

By viewing a scene through a viewing glass that will give this compensation we can more accurately judge how the relative contrast should be changed to create the desired effect. Then by adding a color filter to the viewing glass so as to look through both at the same time, the change of relative color contrast that is seen through the combination will be had when the color filter alone is used to photograph through. Because the viewing glass has in effect changed the color sensitivity of the eye to the same sensitivity of the film by adding the color filter to the viewing glass and looking through it, it is substantially the same as adding the filter to the camera and photographing through it.

If compensation for the difference between the visual balance and the photographic balance is all that is desired when a filter is used, the test is simple.

We first determine with the naked eye just what the balance is in the scene. Then we add in front of the viewing glass a filter that will give us the same balance as we secured with the eye. Just what that filter is to be, of course is determined by the colors being photographed. By this method we secure the photographic value of the scene when that particular filter is used.

The use of the viewing glass alone, of course gives us the value without a filter. Having that base to work upon, it of course becomes reasonably simple to determine what filter is to be used, by determining the color contrasts we want and then applying the filter in front of the viewing glass to get a more definite interpretation before we expose the film.

News Cine Photography Is Different

by

George J. Lancaster, A. S. C.

Editor's Note: We had frequently wondered why the News Reel man had not graduated to the faster film, barely with the news he must secure regardless of the time of day. Super-sensitive should prove a god-send to him. More speed in the early morning and late afternoon. More speed on interiors. Better photographs and a lower chance to display a bit of good photography with the use of filters. We have also wondered why the newsreel cameramen stationed in Washington, D. C. are not initiated into the use of Sphero filters to give the great of the country every photographic advantage that our craft knows. Surely it would be advisable to apply some photographic trick, especially when photographing the leading ladies. It must be recognized that these pictures are shown in every civilized land on earth . . . and some not so civilized. George J. Lancaster, a news reel man of many years' gives us a partial answer in the following article.

George J. Lancaster, A. S. C.



WHY should news reel photography differ in quality from that of production? The same principals are applied, the cameras, lenses and rules are identical as used on lots and studios. News photography seems so cold, so hard. Why have news reel companies continued to use Ortho film when faster stock was available?

In the old days, speaking motion-pictorially, as the news reel industry is comparatively young, its beginning dating back to 1910, when J. A. Dubony brought to the screen the first news reel in America, the *Pathe News Weekly*, news reel photographers were not recognized as part of any news event that was taking place. The police were not news reel minded, so to speak, and hampered the men on repeated occasions in their "getting the story." Many a news reeler was chased off the scene of action because of the uneducated policing of the lines. So the cameraman became a "picture snatcher." They would break through the lines, set up and start cranking before the burly cop would get to them. Focusing and lining up a shot was done in a split second, thus no time was given to warmth or beauty in photography.

As time went on, competition entered the field, if it were not a race to beat the cops, it was a race to beat the opposition to the screen. It soon became a merry chase. He had to possess a zip and go after it, sprint, danger or taboo never entered his mind or stopped him. Get the picture on the screen before the opposition was his only thought. Exclusives, scoops and beats were his pride. To out do the others was his delight. Double crosses and run-arounds were frequently practised. It made him popular, one who can "cut the buck."

So with scoops and beats in mind little thought was given to photography. Editors wanted pictures. They had an issue to get out, they too had opposition to contend with. And, who be to the cameraman who sent in an out

of focus roll of film, or out of frame or heads cut off or cockeyed set ups. Such excuses as "I didn't have time" or "kibs were not accepted, he knew it was the "alley" for him if he did, the way of all scrap film.

So they became a hardened lot, but always good friends of the job, always ready to help a fellow newsreeler in case of distress.

Once a terrible thing happened to me, in the silent days. I was in the Seattle office of Paramount, one morning cleaning my camera, oiling the works. The *De Sine* was loaded and threaded, the take-up magazine was removed so as to enable me to get at the machinery. The phone rang, a hot story was breaking. I hurriedly closed up the grind box, grabbed the tripod and screamed to the scene of action. After clicking off several yards of tape, my camera jammed, upon opening the take-up-side, yards upon yards of negatives fell out. I plum forgot the takeup magazine. Imagine my embarrassment—was my face red? The rest of the gang looked over, one of them said "Oh, Oh—" I took the film and hung it around his neck and said, "Here's something to remember me by." It was the alley for me. A couple of hours later I walked the cameraman, one on whom I had hung the film. He threw a four hundred foot can on my desk and said, "Here's something to remember me by." It was a lavender on the story I muffed. "I'll do as much for you some day, this favor calls for a drink." It only goes to show how the boys help one another. I'm kinda getting off my story.

As for using Ortho film entirely one must take into consideration, news photographers are all over this cock-eyed world. Go anywhere, I don't care where, you'll find a knight of the tripod getting a story. Arctic circle, South Pole, China, up in the air, down in the sea, you'll find a news hound cranking. New and faster film may come and the old may go, but to him the old stand by was his to grind. He had little time to think of the new. If he wasn't shooting hot news, he was busy thinking about a "cook-up" or an issue to make, film to ship, or a long day of travel to a set up. Contacts, time and weather elements, sproops, sproons, hiles and a thousand other things that he must know, no wonder he had little time to read upon the new gadgets or film or what have you? As long as you could see a picture, what the — Then take the lab, they

EXTREMELY

FINE GRAIN

...THAT, of course, is the first essential in any film that is to serve satisfactorily for projection background shots. Eastman Background Negative has this prime requisite ... *plus* adequate speed... *plus* excellent processing characteristics. In short, it is being demonstrated every day that this new Eastman film is ideally adapted to its important special purpose. Eastman Kodak Company. (J. E. Brulatour, Inc., Distributors, New York, Chicago, Hollywood.)

EASTMAN

BACKGROUND NEGATIVE



Newly Designed Sound Head of the Cinema Sound Equipment Company

New Studio Recording-Head

A NEW studio-type recording-head for double-system sound-recording has just been announced by the Cinema Sound Equipment Company, of Hollywood. According to Chief Engineer R. C. Wilcox, of this firm, the new head incorporates many improvements over previous models.

"A great deal of attention," he states, "has been paid to the constructional details of the new model; in selecting the best materials and designs possible. The drive shaft is of nickel alloy steel, S. A. E. 2335, a tough non-warping steel. Two multiple thread worms on the shaft were cut integral with the shaft. These two worms drive the feed and sound sprockets through accurately cut bakelite gears. The spindles, also of nickel alloy steel, which carry the two sprockets are of a large diameter, precision ground, and fitted to sleeve bearings. The sound sprocket shaft has a bearing on both sides of the flywheel to eliminate possibility of the shaft bending. A 17½ lb. flywheel on the recording sprocket shaft assures uniform film travel, the flywheel being driven through a set of felt damped springs.

"Cast bronze was used for both sprockets. The sprockets are precision cut and then chromium plated to prevent

wear from film friction. It is an accepted fact that the larger the sprocket, the more accurately it may be cut and also the percentage of error per tooth is inversely proportional to its diameter. For these reasons forty tooth sprockets were used.

"The driving mechanism is simple, there being but three pairs of gears, a worm and wormgear for each of the sprockets and a pair of spiral gears to drive the footage counter, which is of the three figure, reset type. The lubrication problem is also simplified by the minimum of gears and bearings. Two oil cups at the top of the box carry oil to both the gears and the sleeve bearings of the sprocket shafts. The bearings have oil grooves to properly distribute the lubricant throughout their length and are of ample size to last for years without attention other than periodical oiling. The motor drive shaft runs on ball bearings which are packed with the proper grade grease before delivery.

"The head is driven with a 1-12 h. p. motor connected by a flexible coupling. There is also a flywheel on the motor shaft to minimize motor shaft hunting. Either an A. C.—D. C. interlocked motor is supplied as the driving means, or a 220-V. 3 phase synchronous motor or a 110-V single phase synchronous motor. When the A. C.—D. C. interlocked motor is used, a heavy duty control rheostat is located in the base, and a tachometer is provided in the head to check the motor speed.

"To eliminate the possibility of film buckles through the failure of the magazine belt to operate, an automatic belt tension device is incorporated. Through this device, the tension of the belt is automatically adjusted to maintain the same pull on the film at all times regardless of the amount of film in the magazine.

"Oversize film, hold down rollers of the camera type assure proper film travel on the sprockets and, because of the ample size of the box, threading is easily accomplished. The head is designed to use Bell and Howell magazines, but other types of magazines may be used if desired.

"The film shoe is of such design that the emulsion surface of the film does not touch the shoe. This is done by placing the shoe so that the celluloid side of the film contacts it, and not the delicate emulsion. By reason of this, scratching of the film is limited to the celluloid side and because of its relative toughness is negligible. In connection with the special film shoe, an optical slit is provided, the aperture of which is located .002 from the film so that nothing touches the emulsion surface during its travel through the head.

"Another optional feature of the sound head is the inclusion of a photo electric cell placed directly behind the film shoe for monitoring of the track as it is being recorded. When this is built into the head a thoroughly shielded pre-amplifier of two stages is provided in the base of the box.

"Another new piece of equipment which goes to make up the head is a new 200 V. glow lamp.

"While the sound head and associated equipment was designed primarily for studio work, it is not so large and heavy as to prevent its use in a sound truck."



Congratulations Mr. Schneiderman on "Pilgrimage" and your "RAYTAR" lenses

THE sensational photography by George Schneiderman, A. S. C., in the Fox photoplay "box office hit," "Pilgrimage," has evoked the admiration of cinematographers and the general public. "In all probability, some of these scenes are as close to three dimension photography as can ever be attained with a single-lens system," says American Cinematographer.

This well-merited recognition is a source of profound pride to Bausch & Lomb, designers and pro-

ducers of the "RAYTAR" lenses used by Mr. Schneiderman.

Make no mistake—the man behind the lens is the supreme factor in superlative photography. But the right lens in front of the man is what enables him to reveal his inborn artistry to appreciative millions.

Literature on "Raytar" lenses, the outstanding new development in motion picture optics, will be sent on request.



BAUSCH & LOMB
OPTICAL COMPANY



ROCHESTER, N. Y.





WHEELS OF INDUSTRY

Home Movie Film

● The Pellex Film Company this month announces a new type film for the amateur to be known as Pellex Economy in addition to the regular Pellex 16mm cine film they have been marketing during the past eight months. Mr. Walter W. Bell of this company reports that this new film of the regular reversible type will be marketed on daylight loading spools like any other film and will fit all 16mm cameras, the price to be \$2.25 per 100 foot roll.

According to the announcement this film will not replace the regular Pellex. It is made to fill a need for a low priced film suitable for exterior use under good light conditions. It is said this film aside from being slower renders very good results when used in direct sunlight or light shadow. It is claimed to have a very fine grain emulsion.

Processing facilities have been increased several times during the past month according to a statement of this company so as to continue their policy of one day service on their product.

Kodacolor Assembly

● Of interest to 16mm enthusiasts is the announcement by the Eastman Kodak Company of a change in the present Kodacolor Unit (consisting of projection lens, compensator, and filter) for the Model K Kodascope.

The new Kodacolor Assembly enables the operator to use his regular Kodascope K lens for Kodacolor movies. He need acquire and insert only the filter and compensator, instead of having to buy a complete extra lens.

In addition to greater simplicity and less cost, the new Kodacolor unit gives about 120 per cent increased illumination. It also gives better definition and contrast, resulting in sharper and clearer pictures.

The increase in illumination is brought about by the fact that the regular lens gives over 20 per cent more light than the old Kodacolor lens, and the new filters have a much higher light transmission value than those formerly used. Doubling the light gives the operator

two choices in viewing his pictures, he may project them the same size he has in the past and have them twice as brilliant on the screen, or if he likes he may project them twice as large as was formerly possible, with the same former brilliance. With the new unit on the 260-watt Kodascope, the screen size may be at least 22x30 inches, while the K-50 and K-75 may be used with a 30x40-inch screen, or larger if desired.

To shift from Kodacolor to black and white pictures it is only necessary to remove the filter. The compensator may be left in the Kodascope at all times, with only an occasional removal for cleaning purposes.

Victor 1,600 Foot Attachment

● A large reel attachment for Victor Projectors was announced by Victor Animatograph Corp., Davenport, Iowa, early

posed by the greatly increased film weight.

The improved attachment embodies the same film protection feature with a more convenient and effective, and, at the same time, more easily attached, reel arm arrangement. The arm attachment is now supplied in the form of a V shaped casting (with removable arms) which clamps instantly onto the top of any silent or sound-on-film Victor projector (see illustration).

One important advantage of the improved attachment is that it handles smaller reels (100', 200', 400', etc.) as efficiently as the 1600' reels.

Laboratory Equipment

● Andie DeBore, Inc., announces a complete line of laboratory equipment for the handling of 16mm sound on film. This includes printers for the optical reduction of 35mm sound track to 16 mm, reduction printer for the picture as well as a contact printer for the printing of picture and sound in one operation. All these printers are so constructed that two 16mm prints may be obtained in one operation. Also a compact developing machine (7 ft. long, 3 ft. high and 3 ft. wide) with complete thermostatic control, air conditioning and circulation of the bath.

Erodite

● An announcement which will find an appeal with the serious amateur is made by J. C. Hale & Sons in their Erodite, which is a unit containing six lamps. This is made complete with tripod and 12 feet of connecting cord. A case is also available for this lighting unit. It will not only find value as a direct lighting unit, but the ingenious amateur will undoubtedly find it a very fine brodifor overhead lighting so as to secure an overall balance that is usually difficult with present facilities.

Super-Reels

● Bell & Howell Company has developed 1200-foot and 1600-foot 16mm film reels for continuous projection of 16 mm sound pictures for periods of a half hour and 45 minutes. Also the film sound, the 8 & 16 sound-on-film 16mm.

(Continued on Page 290)





AMATEUR SECTION

Contents . . .

EXPOSURE Makes Reserve Professional by Clyde DeVore, A.S.C.	222
AMATEUR Movie Making in Europe by D. Knehl	223
PROFESSIONAL Methods in Amateur Lighting by Charles G. Clarke, A.S.C.	224
TEN Common Mistakes of the Amateur by Frank B. Good, A.S.C.	226
16MM Camera Exposes Frauds by C. B. Harris	227
RECORDING Sound on 16mm Film by Eric M. Berni	228
AMATEUR news	230

* **PROFESSIONAL** Criticism of the Amateur picture is a part of the service offered by the **AMERICAN CINEMATOGRAPHER**. Many are not aware of this. Hundreds of pictures have been reviewed this past year by members of the American Society of Cinematographers for the Amateur.

Next Month . . .

* **THIS MONTH** Our 1933 Amateur Contest Closes. Indications are that we will announce the winners on our December issue.

However, in the meantime our next issue promises many interesting articles and stories. One of outstanding value will be a frank and comprehensive discussion of the various types of film available to the Amateur.

Mechanical phases of picture making will be touched upon as well as the artistic side.

Exposure Meters Become Professional

by

Clyde DeVinna, A. S. C.*

Yes, it is not fool proof—that is you have mean stick to its readings and your interpretations of it. It is not fool proof . . . that if you have to treat it with a reasonable amount of respect. Don't expect it to give you the correct reading if you do not aim it correctly. I use the word aim, because I believe it is the most descriptive word of what you really do with an exposure meter that I could employ.

No exposure meter has "ouija" board proclivities. You have to understand it the same as an engineer must understand his slide rule . . . only it is not so difficult to understand as the slide rule.

If you do not point the lens of the camera at the picture you want to secure you are not going to get that picture . . . you'll get the picture the eye of the camera saw. If you don't point your exposure meter at the picture you intend to take, you will naturally get a different reading than the one which is correct. It's for this reason I say stick to your exposure meter. Possibly you will find that there is a variation in the reading and the results. Well, that's your correction factor for the way you use the meter. If you use it consistently in that way that is going to be your correction factor all the way through. I claim the meter is not wrong . . . it's the operator that is wrong.

You didn't learn photography the first time you clicked a trigger or pressed a button. Your exposure meter is mechanical, but still it must be studied, you must become familiar with its mechanical operation.

There are two basic types of exposure meters that have come to my attention the one using the photoelectric cell and the other using what is termed the "light wedge." I am not going into the technical description of these meters or into their relative merits. I know people who swear by both types.

It is generally believed that the professional cameraman feels himself above exposure meters. This is hardly true today. I know that on the lot at the MGM studios there are several of the best men using them. Charlie Clarke, A. S. C., employs a meter. Many men have come to me asking my advice on what to do in various countries I have been in and I have invariably advised them to get a good exposure meter.

It has been my lot to travel much. Recently a picture took me to Alaska. As soon as I returned I was assigned to a picture being made in New Orleans. From there I was



Clyde DeVinna, A. S. C., the famous "Traveling Cinematographer" explains his exposure meter to John Parker, picture artist.

sent to make snow scenes in the High Sierras. I used the exposure meter because I know it measures the quantity of light that is being reflected from the scene I want to take. I know it is going to give me a reasonable over-all reading, and it's the over-all reading that's important.

Let's take snow as we had it up there in Alaska when I was shooting scenes for "Eskimo," the MGM picture which will soon be released. If you are an experienced photographer you know there is a strong reflection of light from the snow, but what is the quantity of that light . . . your guess is just as good as mine. You are going to hit it closer with an exposure meter, because I say again it is going to give you an over-all reading, not only the light reflected from the snow, but the quantity of light reflected from the subject you are shooting. And that quantity of light is also going to be influenced by the amount of direct light from the sun that is hitting it. In other words moisture in the air is going to affect these conditions as much as though there were no snow on the ground.

While the sun seems intense in the tropics still we know from experience that it is necessary to open the lens stop more than if shooting out here in California, because there is more moisture in the air. I have found the exposure meter gives me the quickest answer.

The professional cinematographer does not use the meter on studio sets. There we have such a wonderful control of lights, have had such a wide experience that we know we are correct in our stop if we set it anywhere from F2 to F4. You see we can place lights wherever we need them, but out of doors, especially on distant expeditions the only assistance we have is in the way of reflectors and of course we cannot jerk the sun around the same as we do a lamp in the studio.

Look upon your exposure meter as a light measuring instrument. Something that never gets tired or bilious. It's mechanical . . . if it's right once it's bound to be right every time. However, there are times when you must

(Continued on Page 234)

*—Clyde DeVinna, A. S. C. has photographed such outstanding productions as "Trailer Hone", "White Shadows", backgrounds for "Lupinus Arma" and others.



D. Kneigt, Author of this Article and President in European Cine Club Work.

Amateur Movie Making in Europe

by

D. Kneigt

Hon. Secretary of the Nederlandse
Smaalfilms Amsterdam (Netherlands)

IN EUROPE, as in the United States, we have some experience in the inter-club-change of film ideas, due especially to national and international contests being held in various countries of the European Continent and Great Britain. We have created a yearly contest covering a number of countries which represents the pinnacle of interest for European amateur cinefilmmers. Belgium (Union Belge des Cineastes Amateurs, Brussels) in 1931 started the first international contest (I. Concours International du Meilleur Film d'Amateur).

Holland was in charge of the Second Contest in 1932 and France will conduct the Third International Contest, to be held in Paris in December. The last international contest covered five countries, the second nine countries and

in third contest is said to cover about fifteen countries. (France, Great Britain, Germany, Italy, Spain, Portugal, Austria, Hungary, Netherlands, Belgium, Czechoslovakia, Switzerland, Yugoslavia,) whereas United States, South Africa and Japan have also been invited to participate. Cinephotographers from any other country in the world may participate in this interland-contest, writing for details to Cine-Amateur, 94 Rue St. Lazare, Paris (IX).

These contests are organized in the form of exclusive entries representing each country in the various classes; the entries being selected by an official organization (league, club or magazine in each country). Consequently each country may only participate with one film for each class of 16 mm, one film for each class of 9.5mm, and one film for each class of 8mm. There are classes for scenario films (play-film), documentary films and so on.

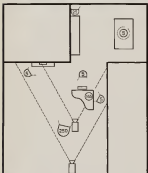
As far as the United States are concerned, we nourish high hopes that the international contest of 1933 in Paris will, for the first time in amateur movie history, show the participation of American products. We take it that through the intermediary of the American Cinematographer there will be a way to do so. May our hopes not be disappointed!

What about amateur movie making in Europe? We have been assigned to write a series of articles on the activities of European cinefilmmers. For the beginning we may mention that a number of European countries have splendid national organizations, whereas local clubs and individual workers are found "en masse" in any place. However the number of serious, advanced amateurs is restricted and in consequence thereof membership's lists of the leagues and clubs in European countries in general are not in proportion to the number of hobbyists in each country. Holland perhaps is exceptionally favoured in this respect, because the Nederlandse Smaalfilms, Amsterdam (Dutch Substandard Film League) with over 400 members, is numerically the strongest organization in Europe, at least taking into consideration relative populations. Moreover the Dutch amateurs have done splendid work in winning both in 1931 and 1932 first prizes in the documentary classes 16 mm and 9.5 mm in international contests. The first prize-winning documentary film 16 mm in the 1932 contest ("The Street"—3 reels) of Messrs. Carné and Scheffer, Rotterdam, Holland, ought to be seen in the U. S. as a specimen of fine and artistic amateur work of European style.

Another European amateur movie organization which is very active, is the Austrian club: Klub der Kino-Amateur Oesterreichs, Vienna. The Vienna amateur, in spite of the rather difficult times, economically speaking, for the Austrian Republic, is apparently doing a lot of film work. We intend to bring into this series of articles activities of the Austrian amateur. For the present we can give only a glance at the activities in some of the countries, where amateur movie work is manifesting unusual activity.

Great Britain and France are, as may be known, countries with highly developed amateur organizations. In both countries the scenario film (play film) is the vogue, in full contrast e. g. with Holland, Germany, Hungary, Austria, etc., where the documentary film is the favorite.

(Continued on Page 235)



NOW IT WAS DONE: Arrangement of the lighting-
units. 250-Watt "Parabolic," with diffuser baffle
summer; 500-Watt floor by pump; 165-Watt globe on
lamp on pump; 500-Watt light behind subject, and
another illuminating back wall. Parabolic bulb in
shades for lighting for room, and 250-Watt tubular
bulb in improvised reflector on floor behind actor.

WHEN the professional cinematographer starts to light a studio set, he has at his disposal a practically unlimited number and variety of lighting units, ranging from huge 10,000-Watt reflector-spots to tiny "baby-spots" equipped with ordinary photofloods. When he turns to his own 16mm work, he finds himself bound by the same restrictions as any amateur—only a few lighting-units at hand, and definite limitations as to the amount of current he can safely draw from his house-wiring. But he can take with him one vital thing from his studio work: the professional attitude toward lighting. This is something which can be of immeasurable value to the non-professional, as well, for it will help him to make the best use of what he has available in equipment, and to create effects he might otherwise overlook.

Lighting, to the professional cinematographer, is far more than merely laying down enough illumination to permit an exposure; it is more truthfully a matter of painting with light—using patterns of light and shadow to model the

Professional

faces and forms of his actors, and to give depth, roundness, naturalness, and a generally pleasing effect to the sets.

All of this can be done equally well at home, with 16mm films; better, in fact, for the general conditions applying to 16mm work give the filmmaker or cine-kodakur several important advantages. In the first place, the area to be illuminated is generally smaller than the average studio set; secondly, while 16mm SuperSensitive film has the same effective speed as 35mm "Super," most 16mm cameras have considerably greater shutter-apertures, and the lenses used are decidedly faster. In other words, since the 16mm user has, as a rule, a camera with a shutter-opening of around 215 degrees, and a lens working at $f/1.9$, while the professional camera has a 180 degree shutter and $f/2.5$ lenses, the man with the 16mm can get the same effects with a much smaller expenditure of light than the studio man requires.

There are, of course, two ways of attacking the problem: one may begin by laying down a sort of foundation of light, sufficient to give a general level of illumination sufficient for an exposure, and then build up your detailed effects, or one can begin by arranging the effects, and then, checking, perhaps, with a reliable exposure-meter, fill in whenever necessary. Of the two, the latter is decidedly the better course, for in most cases, once you've arranged your lights to give you the effects you want, you will find that you will naturally have the right volume and balance of illumination, while, once the lights are so arranged, only a little manipulation will be necessary to fill in.

As a rule, of course, the starting-point for lighting any set is to decide what is the keynote of the action of the scene; nearly always, we will find some one thing—a person, a face, or even some inanimate object—can be definitely labelled as the central point of interest in a scene. If we begin by lighting that properly, then filling in the rest of the set, our problem is immediately simplified.

So much has been written in these columns about the lighting of people that very little can be added here. The best starting-point in lighting any scene is to light the people attractively and naturally, carrying out in this lighting the effect of light from the sources which would be natural to such a room and such action. Then, the remainder of the room can be lit to carry out the same idea.

It is a mistake, frequently made by amateurs, to attempt to light an interior scene simply on a basis of illumination. The scene shown in the illustration, for instance, could have been lit in a much simpler manner by merely placing two or three strong lights in front of, or slightly at the side of the subject, and letting the general flood of light carry the rest of the room. But the effect on the screen would have been flat and unnatural, so actually as many units and as much care were utilized in lighting the room as were used in lighting the subject himself.

Similarly, the amateur has a tendency to work close to walls—probably because of his limited equipment, and the fear that it would not be sufficient to illuminate a larger area. The professional, on the other hand, fights incessantly to keep the action of his scenes well away from the walls, for he knows that only so can he light his people to the best advantage, and secure an attractive lighting of the set.

Now, as to the more detailed methods of lighting a set? If you will study the illustrations, you will see that the

Methods in Amateur Lighting

by

Charles G. Clarke, A. S. C. and
Wm. Stull, A. S. C.

general effect is of complete naturalness. The lady is seated at the piano: there is a fairly strong light on the left side of her face, ostensibly coming from a table-lamp beside her on the piano. The right side of the face is slightly shadowed, and—apparently from the lighted room behind her there is a rim of back-lighting on her hair and shoulders. Behind her, on the wall to her right, is a wall-bracket, obviously one of a pair: these throw pleasing shadows of the mantel, etc., on the wall, relieving its drab whiteness, and giving a sense of depth and roundness. They also throw a splash of light across the folds of the curtain in the doorway, giving a more natural effect, and offsetting the flat blackness such a curtain would otherwise give. In the room behind—well silhouetted by the dark frame of the curtain—shadows of the chairs are cast on the wall, again relieving a blank expanse of white surface.

That is what we see on the screen: but how is it actually done?

Let's begin at the beginning: the front-light. The principal front-light ostensibly comes from the lamp on the piano. Now it would be perfectly feasible to use that lamp as the actual source of the light, by putting a photoflood bulb in it. However, the arrangement of the shade is such that this would be likely to give a harsh horizontal shadow across the middle of the subject's face, so instead we put a fairly strong bulb (165-Watts) in the lamp, and used a 500-Watt light, placed just out of the picture, and quite high, to supply the actual light. The secondary front-light, which relieved the shadows on the other side of the subject, came from a home-made "broadside," fitted with the 250-Watt tubular bulbs (only one of which was burned), and a simple diffuser of white silk. We're really quite proud of that "broad" as it was made from a 15c aluminum dishpan, a couple of strips of angle-iron, two sockets, and an old-music-stand. Fitted with the shorter photofloods, it could easily be made as a four-bulb unit, it is cheap, and, while not as efficient as a properly designed lighting-unit, very useful.

Obviously, the back-lighting could hardly come from the lights in the farther room, so we placed another 500-Watt light behind the subject, as low as its stand would permit, and with the lamp itself tilted well up.

This lighting would, in itself, be sufficient to give a good exposure, with a nice lighting on the subject; but we can improve things a lot by placing a few units here and there

to light the room as well. For instance, the modeling (or shadow-casting) light on the back wall: first, we lit the two wall-brackets—not for illumination, for they were fitted with small, flame-colored bulbs of negligible photographic value, but so that they would appear to be the sources of the modeling-light. The actual light for this purpose came from another 500-Watt light placed well out of the picture, and fairly close to the wall. It was raised as high as the stand would go, and tilted so that it gave the desired light-and-shadow pattern on the wall. The illumination of the far room was managed simply by putting a photoflood in the chandelier: this gave a strong general flood of light throughout the room. The back wall of this room seemed to offer too large an expanse of unrelieved white, so we pressed into service another emergency-unit: this one consisted simply of a wooden base, a socket, and a sheet of heavy tin about a foot long by six or eight inches wide, bent to form a U-shaped reflector for a 250-Watt tubular bulb. (The small, hand-lamp reflectors for photofloods would do just as well.) This was placed on the floor, hidden from the camera by the buffet, and arranged to cast the shadows of the chairs (which were moved out from the wall a few inches) onto the wall, thereby breaking up the flat, white surface. Thus, by just a little added effort, a few extra lights placed judiciously, and a photoflood or two in the regular fixtures, we were able to light up the two rooms so as to get a pleasing, natural effect rather than an ordinary, flat lighting.

The same general ideas can be used under almost any conditions encountered in home interiors. In almost every room you will find projections of one sort or another which can be utilized for creating shadow-patterns; or, if necessary, the furniture itself can be used to cast shadows on flat, white walls. It is always a good plan to base your lighting on natural effects: that is, to work it out so that, on the screen, the light all appears to come from sources natural to such a room. For much of this, photoflood bulbs judiciously placed in the regular fixtures, are invaluable, while a few of the many small photoflood units such as the well-known "Fluctors" come in very handy for use in low positions.

These same general rules will apply, of course, to Kodachrome interiors, too, with the exception that in Kodachrome you will need about 50% more light overall, and a stronger front-light than is ever desirable for black-and-white. For this purpose, especially, the new "Brodithe" 6-photoflood "Broadside" should prove invaluable.

There is another phase of interior lighting which is all too seldom considered by non-professionals. This is the use of

(Continued on Page 234)



NOW IT LOOKED ON THE SCREEN: Note shadow of mantel and wall-brackets on wall, high-light on draped curtain, and shadow-shadows on wall of back room: also back-lighting on subject, and carefully placed

Ten Common Mistakes of the Amateur

by
Frank B. Good, A. S. C.

PERHAPS there are more than ten mistakes the amateur commonly makes, but ten is sufficient to point out the outstanding weakness of the cinematographer. None may possess all of them, some may have conquered all of them, there are many who have one or more of them.

Possibly it is because they look upon cinematography as a toy, something that is taken in the spirit of the moment and the many details that must be watched for good photography are left to the gods.

Let's jump into the frying pan and look these mistakes right in the eye and then mull over them:

1. Over exposure
2. Poor focus
3. Too fast panning
4. Unsteady camera
5. Walking while shooting
6. Too much footage on no action pictures
7. Poor composition
8. Lack of continuity
9. Not enough close-ups
10. Do not change exposure for close-ups

Over exposure is undoubtedly due to the timidity of the operator feeling that the film cannot possibly be as fast as the manufacturer claims. Sometimes it is due to the fact that the operator just does not check exposure before he starts shooting. Believe in that label the manufacturer puts in the box with the film. He has spent many dollars to secure that information. He wants you to secure good pictures so he will not give you mis-information.

Then we come to poor focus. Just another bit of carelessness. The lens is arranged for different foci so as to give you better pictures. If you haven't a distant meter it is much better to make a good guess at it than it is to ignore the question entirely, or pace it off, figuring about three feet to the pace, you'll come mighty close to the right focus.

And here's the old bugaboo that every writer shoots at the amateur every chance he gets. Don't pan so fast. It's better not to pan at all than to pan fast. Make them as consecutive pictures. Pick out the highlights and make individual pictures of them. Just to pan on scenery does not add to its interest. Do not pan unless you have action,

then follow the action. Learn that first and then attempt other panning.

When you hold the camera in your hand hold it steady, or your pictures will be unsteady. Clamp your elbows to your side and stand firmly.

Some people think they are a perambulator. They walk while they are panning the trigger and especially backward. You walk more awkwardly backward than you do forward, and still your body weaves in walking forward so that the chances are far less for good pictures in walking backward than forward and your chances of getting good pictures in walking forward are nil. Figure that there are some limitations to good pictures and do things the simplest way.

There is nothing more boneless than to see foot after foot unwind on a picture in which there is no action. There is nothing to interest one. Motion pictures were designed for motion. The occasional shot of a non action picture has its place, but do not waste footage on it, it's dull, waste of film and you could get a much better picture with a still camera.

This thing of poor composition comes mostly under the head of having people half out of the picture and half in. By this I mean cutting off their heads, having them way over to one side of the picture with nothing at the other side of it. Take your camera out and practice without film in it. Let your people go through action and then attempt to keep them properly framed in the finder. Reading and learning a thing will not help you. You have to apply what you learn.

There's that lack of continuity. Pictures of people and things just snaps, taken for no reason. Even pictures taken for no reason can be interesting. If it's worth taking do not only take a long shot, take a quarter shot of it and then a close-up. This is usually sufficient continuity to make it interesting. If you take a picture of a child playing, the close-up may show a smudge on the face, freckles or something else that will be interesting.

Of course not enough close-ups has right in with the lack

(Continued on Page 224)





Photo by John P. Cooper, A. S. C.

16mm. Camera Exposes Insurance Frauds

by

C. B. Harris

ON THE morning of November 29th, 1929, while standing on the rear platform of a Los Angeles Railway car a collision occurred, allegedly causing Mr. R. to be thrown forwards, striking the rear of a seat in front of him, and then to be thrown backwards, in turn striking his back against some object in the rear. He was not thrown from the car, he did not fall to the floor of the car nor was he rendered unconscious.

The allegations in the complaint were as follows: "That the patient was greatly and grievously wounded and injured, temporarily and permanently, and that he sustained a severe concussion of the brain resulting in headaches, visual blurring attacks, redness of the right eye, sensation of explosion in the right fronto-parietal region, sleeplessness, dragging of the left leg and coldness of the left leg, and also suffered from deep pains in front of right thigh and knee, and also emotional disturbances as well as severe nervous shock and tremors, confusions of the occiput, spine, both jaws and a lot more complications that would read as though the American Expeditionary forces had been wiped out.

\$100,000 was asked by Mr. R. but the jury awarded him \$30,000. This large sum seemed to work like magic on the victim. He invested it in a gold mine. Investigators found him working about the mine, pick and shovel, carrying and hauling. They spotted a 16mm camera on him at a distance, using a telephoto lens. Unfortunately however, in this

case, by the time the case was brought to court the gold mine had played out—a complete failure.

This is a case taken directly from the files of Dr. William Louis Weber, chief surgeon, Pacific Electric Railway Co.

Another interesting case presented by Dr. Weber was where the victim was in an automobile accident with a street car. He claimed to be bad ridden. His wife conducted a rooming house and one morning a young chap moved in who developed a great hobby for Amateur motion picture photography. The victim having nothing to do took a great interest in the young fellow's hobby and permitted him to take a few pictures of him. As the acquaintance ripened they went homeback riding together, as well as boating and swimming. Motion pictures were taken of this by the young chap, who of course was an investigator for the Railway company. These were presented in court and the suit for \$75,000 was naturally thrown out.

This was a case where a few hundred feet of film saved that company a very large sum.

It was our belief that it might be necessary when securing pictures of this sort to establish something or somebody in the film itself to determine time of the taking of the picture, however, according to the evidence presented in cases in the past, it has been only necessary to swear in the photographer, for him to give his evidence, identify the film and then have the film projected.

However in some cases according to H. H. Delley, a prominent investigator of Los Angeles, when it was felt that the defendant might attempt to establish the fact that the pictures were taken before the accident they continued to get a second person in the film with him or have additional witnesses.

Delley tells of an interesting case in connection with Ramon Navarro, the motion picture star who was sued for a very large amount after an auto accident. The defendant claimed total disability. However through the 16mm camera he was shown carrying rock, launching a motor boat, homeback riding and otherwise doing strenuous work.

Of course, telling about what these pictures contained seems like easy work. The operator must be ingenious, and many times a bit crafty to lure his victim before the lens. Frequently the telephoto lens is brought into use. In the Navarro case a cameraman was stationed in an empty house across from a building being erected and the man was shown working on heavy construction work.

Delley points out that it is absolutely necessary to identify the man at his work. That is, a long shot that does not definitely identify him can easily be fought by the defense attorney. It is for this reason that the close-up, and the use of the telephoto lens is so important. While it may not be necessary to be an absolute close-up, it must be close enough to identify the man.

Another case recently which was photographed by Park Reis, A. S. C. was a man who had been awarded \$500.00 a month for an accident which happened somewhere in the east, which he claimed had made him blind. The only trace the insurance company had of this man was through his post office box address in Los Angeles. The box was watched diligently and the man identified by operatives. His habits of arriving and leaving the post office were noted. Then a 16mm camera was brought to the post office. A 1:9 lens was used and super-sensitive film shot at 8 frames a second. The picture showed the man opening the post office box, taking out his mail, opening it and reading it.

Then on another occasion they stationed themselves across from where he parked his car, with a telephoto lens on the camera. This scene showed him getting into the car, driv-

(Continued on Page 235)

Recording Sound On 16mm Film

by

Eric M. Berndt

Editors Note: Because of the strong belief that the 16mm is going professional in an industrial way and that the 16mm camera will in time be professional for that field, we have asked Eric M. Berndt, manufacturer of the only sound on film 16mm camera to give his views and a description of his camera.

BEFORE the introduction of 16mm sound on film, it was considered by many either impossible or impractical to obtain satisfactory sound reproduction from 16mm film. However the great success and popularity achieved by the 16mm projector for sound on film, in the field of non-theatrical motion pictures, refutes this.

The interest in 16mm sound is very great, and three of the projector manufacturers have met this demand with sound on film projectors which are noteworthy for their simplicity of design, ease of operation, portability, and natural reproduction of sound. In conjunction with the increased screen illumination now incorporated in 16mm projectors, pictures may be shown in large auditoriums.

More and more subjects are being made available, consisting mainly of reductions from existing 35mm films. These reductions are of high quality pictorially and good sound is achieved either by re-cording or optical reduction.

16mm sound pictures have also been made directly on the 16mm film. The advantages of photographing industrial, educational, and scientific pictures directly on the 16mm film are quite evident, especially from the standpoint of equipment, operating costs, and processing. It is extremely interesting to note that the cost of film and processing for 450 feet of 16mm, which is equal to 1000 feet of standard, is approximately \$27.00, either by using reversal or negative-positive system.

In step with the development of 16mm from purely amateur to more academic and professional uses, the professional 16mm sound on film camera, shown in the photograph, was built. The camera was designed to photograph sound and picture simultaneously on 16mm film, and to enable the cameraman to obtain professional effects and refinements in his 16mm films equal to those achieved by the use of 35mm professional cameras.

The camera illustrated is provided with 1000 foot magazines, or 400 foot magazines as desired. The 1000 foot magazines permit a continuous run of 28 minutes to be made, equal to 2500 feet of standard. The camera and magazines are made of cast aluminum and finished in chromium trim and black crackle. It may be had with 110-volt A. C. synchronous motor, or universal 110-volt governor controlled motor. Provision is made for hand cranking at eight frames per turn, or one frame per turn. The intermittent movement is silent in operation. The



At top the Berndt Sound on 16mm film camera. At bottom the sound electrical recorder.

sound sprocket is highly filtered in order to obtain a perfectly uniform flow of film past the recording optical.

Since 16mm film travels at a speed of 36 feet per minute, it is necessary that a camera of this kind be built to the highest standards of mechanical accuracy. Some of the camera features are the four lens turret with standard lens mounts, variable view finder, focus on film with 10X magnified upright image, frame counter, footage counter, reverse take-up, optional dissolving shutter, and etc.

The accessory electrical equipment is carried in two cases, one containing the recording amplifier and batteries, and one for the condenser microphone, cables, earphones, etc. A single 864 is used in the head amplifier, and five stage cascade 864's with a 771A for power output. The amplifier has a gain of about 85 DB, is stable in operation, and free of microphonic disturbances. Compensation is incorporated for high frequencies lost by film characteristics and printing.

Variable area was chosen as the most suitable type, for 16mm recording, because of its ease of processing. It also eliminates the large number of B batteries required for glow lamp.

Many films require careful attention in processing, when taken under unfavorable photographic conditions. With variable area recording, more attention can be given to the picture, since processing variations will not affect the track as much as they would if it were a density track.

The recording system consists of an exciter lamp, an improved type of mirror galvanometer, and an optical system which projects the oscillating beam of light onto the film forming a slit of 3 thousandths.

A rheostat and milliammeter serve to regulate the exciter lamp intensity, so that the proper exposure for the different emulsions may be achieved very easily.

A visual monitor is incorporated which permits the oscillating beam of light to be observed, magnified, through the film, and permits checking the amount of modulation,

(Continued on Page 231)

On Location at Home



CINÉ-KODAK SPECIAL

*offers professional cameramen
many facilities formerly found
only on studio cameras*

"GIVE us a 16 mm. camera for off-the-lot use up to professional standards of ability but well below professional standards of cost and size." That was a big order.

But Eastman has done it in the remarkable Ciné-Kodak Special—a precision-made, custom-built 16 mm. camera of unparalleled versatility which lifts the lid off the restrictions of usual home movie technique.

*Professional Ability—16 mm.
Economy*

Many of the Special's most noteworthy features are identical with those that studio cameras provide. There's a reflex finder which shows on a ground-glass screen the field of the taking lens, permits visual focusing with all lenses; variable speed control, from 8 to 64 frames per second when spring-motor driven; variable shutter for fades and lap dissolves; double lens turret, mount-

ing any two of the six lenses available for the Special; 100-foot and 300-foot interchangeable film chambers permitting instant switching from one type of film to another; long-running, spring-motor drive; one- and eight-frame shafts for hand cranking—the latter being used as well for winding film back for lap dissolves or multiple exposures; two film meters, one geared directly to the camera mechanism recording the amount of film run or rewound, the other on the film chamber showing the amount of unexposed film.

Alterations on Order

The standard model Ciné-Kodak Special, with Kodak Ansigmat f.s.p. lens, double lens turret, one 100-foot film chamber, set of six masks, is priced at \$375. Other accessories are extra. Special alterations to specific needs will be readily estimated and painstakingly executed.

See this precision-built, custom-made camera now at leading Ciné-Kodak dealers', or write for the Ciné-Kodak Special Book.

If it isn't an Eastman, it isn't a Kodak

EASTMAN KODAK COMPANY, Rochester, N. Y.

FADE-OUTS, FADE-INS



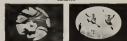
The Special's variable slit shutter may be moved from open to closed, or vice versa, while the camera is running, for making fades and lap dissolves.

MULTIPLE EXPOSURES—LAP DISSOLVES



The eight-frame shaft rewinds the film backward for making double or multiple exposures and lap dissolves.

MASKS



The Special's masks, supplied in a neat pocket size leather case, are neatly slipped over a shot before the film. Comedy, oval, and heart-shaped and optical half-masks are standard equipment—other designs supplied on order.

World Wide Interest in Cinematographic Competition

●Again the annual contest conducted by the AMERICAN CINEMATOGRAPHER will be world wide in its representation. Already films have been received from several foreign countries and from letters stating pictures are being shipped to arrive before the closing date, there is an indication that there is a keen interest in this competition by many of the amateurs across the Atlantic.

From every indication this year's competition will be even greater than was the 1932 contest. The wide circulation given the pictures of last year's contest has engendered an interest in this competition that is much wider in its representation from the geographic standpoint.

Again members of the American Society of Cinematographers will act as the judges. A recognition in this contest is considered by amateurs the world over as the greatest honor they can achieve from any body of professional cameramen.

The American Society of Cinematographers, made up as it is of the leading directors of photography in Hollywood's studios, its members are acknowledged the camera masters of the world.

Medallions will be awarded to winners which can be either worn or placed

Gaertner Turns to Comedy

●W. Gaertner, of Detroit, is entering poker with pictures, that is, his latest picture will involve this great national pastime as the central theme of a comedy which involves those husbands who attempt to indulge in this pastime without the knowledge of their wives. Probably he'll call it "Poker Faces" or "May I Go Out Tonight, Wife?"

Gaertner will be one of the entrants in the 1933 American Cinematographer Competition. In speaking of the plan to be followed out this year in the recognition to be given entrants, Gaertner remarked: "The awarding of Medallions or Certificates of Merit will no doubt influence many more amateurs, as on this basis a much wider scope is covered."

Metropolitan Club Elects Officers

●Officers chosen by the newly elected Board of Directors of the Metropolitan Motion Picture Club are G. L. Rohdenburg, President, A. C. Decker, first vice-president, C. I. Carboneau, second vice-president, R. M. Coles, secretary and H. Dantz, treasurer.

Annette C. Decker was appointed by Dr. Rohdenburg as editor of the club's official publication "Close-Up" and Miss S. L. Lauffer was appointed director of publicity.

on the camera. Many classifications have been created so as to give a wide recognition of the many phases of picture effort into which the amateur delves.

It is not necessary for an entrant to be a subscriber to the AMERICAN CINEMATOGRAPHER. Like all of the activities of the American Society of Cinematographers this competition was instituted to create a greater interest among the Amateurs in the making of better pictures.

The rules are very simple and will be found on another page of this issue.

Club Makes Sound Picture

●The Cinema League of Philadelphia has announced its first sound on 16mm film production under the title of "To Om by Omibus." The picture was made with the new R. C. A.-Victor 16mm outfit. According to Raymond S. Aarons, president of the club that organization is contemplating entering this picture in the AMERICAN CINEMATOGRAPHER 1933 Amateur Competition.

500 See Prize Pictures in Pendleton

●At a public showing of the AMERICAN CINEMATOGRAPHER 1932 Amateur Prize Winning Motion Picture by J. T. Snelson it was estimated that an audience of more than 500 was accommodated for the event.

Snelson reports that the first prize winner "Tarzan Jr." received as much enthusiastic applause and comment as is given to the professional pictures at the theatres.

Prize Pictures Convert Still Club to Movies

●At a recent showing of the AMERICAN CINEMATOGRAPHER 1932 Amateur Prize winning pictures in Boston, the South Shore Camera Club was a guest of the Boston Cine Club.

Many of the Still Camera specialists became so enthused in these pictures that it was decided to establish a movie section in this club and to endeavor to make a picture for the 1933 competition.

This club has arranged for a showing of the prize pictures in their own quarters for the latter part of October.

Harvey Builds Focuser

●In the illustration immediately above is shown the direct lens focusing which Raymond Harvey built into his Victor camera. The little handle in front is fastened to a tube which pushes up behind the lens forcing the gate back and permits focusing direct through the lens.



Orange Club Stages Special Show

●The amateur motion picture club of Orange, New Jersey at the recent showing of the AMERICAN CINEMATOGRAPHER prize winning pictures expended a great deal of effort in the presentation of these subjects.

Presented in their Little Theatre, special colored lights were employed in the setting of the miniature stage. Semi-synchronized musical scores accompanied the films. Two projectors were employed so as to make the show continuous as reported by Edward J. Hayes, secretary of that organization.

Scientific Films for Amateur Show

●At the October meeting of the Los Angeles Cine Club which will be sponsored by both Eastman Kodak Company and the Bell & Howell Company to be held in the Eastman Hollywood Laboratories, the subjects to be presented will be Cinemicroscopy film in both 16 and 35mm. There will also be a demonstration of the equipment necessary for the making of this type of motion picture.

Evans Makes School Subject

●Walter Evans, associated with the Hollywood office of the Bell & Howell Company, has completed a 200-foot subject which he has titled "Cats and Kittens."

This picture was an experiment on the part of Evans to determine formula and contents of a picture suitable for very young children as an educational medium along the type being used by schools in those classes of young children who have not reached the book stage and have not learned to read and write.

The picture brings out the characters and habits of felines, possibly one of the most adored of children's pets.

HOME MOVIES ARE BETTER WITH FINE GRAIN FILM



PELLEX is a very fine grain Ortho type day-light loading Cine Film for use in all 16mm cameras—It has wide latitude, pleasing contrast and ample speed for all exteriors.

100 FEET

\$3.75

Including Processing

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Film will effect a great saving for those who do not need the faster film. In sunshine and bright shadow Economy Film will render splendid results.

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American Cinematographer

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\$2.50 A YEAR!

Owing to the fine increase in circulation the American Cinematographer has enjoyed during the past six months, the American Society of Cinematographers have decreased the yearly subscription rate from \$3.00 to \$2.50.

The American Society of Cinematographers being a non-profit organization the savings it effects because of this increased circulation is being passed right back to its many readers who have made it possible.

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Please Enter my Subscription for one year starting
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City

AMATEUR MOVIE MAKERS CONTEST CLOSES OCTOBER 31st

ONLY A FEW DAYS LEFT TO ENTER !
HERE ARE THE RULES . . . READ THEM

The AMERICAN CINEMATOGRAPHER 1933 Amateur Competition is open to amateurs all over the world who use either 8, 9½, or 16mm. film.

The films must be in the offices of the AMERICAN CINEMATOGRAPHER not later than October 31, 1933.

There are no restrictions as to the number of subjects that may be entered nor are there any restrictions as to the length of the subjects. The one strict rule that applies, however, is that no professional help is received in the making of the picture. This does not include titles which may be made at a laboratory.

The recognition of those who are given awards will be in the nature of a gold medallion which will be given by the American Society of Cinematographers who will be the judges of these pictures.

The pictures will be given classification so that the competition may be fair to all entrants. By this we mean that an entrant having a documentary film will not compete with one who has based his on a scenario. Of course, there will be more classifications than these. The classifications will be created according to the pictures that are received.

Please remember your films must be in the office of the AMERICAN CINEMATOGRAPHER, 6331 Hollywood Boulevard, Hollywood, Calif., not later than October 31, 1933.

GOERZ

TRIX OBJECTO METER

An exposure Meter Based on a New Scientific Principle

Compares unknown light intensity of object with standard intensity of a luminous disc. Permanent calibration. Due to the long range of exposure readings the Trix is equally successful indoors and outdoors for still and motion pictures including night scenes and snow landscapes. No delicate parts which need replacement or get out of order. Small, light, neat, easy to use and need reasonably priced.

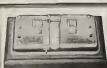


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Manufactured by Dr. Kuhn, they give requisite absorption of excess blue-violet and red wavelengths of modern panchromatic emulsions and a distinct improvement over the yellow type of filter. Equally efficient for normal sensitive orthochromatic emulsions. Consequently Universal filters for all purposes. Supplementary blue filter for additional red absorption, also red filter for night effects. Unexcelled very thin discs of optical glass, plane parallel and of true surface. Combined in sets after great variety of photographic results.

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Lighting The Home Set

(Continued from Page 225)

"booster-lights." Very often, when you are working either indoors, or on porches, etc., in deep shade, you can use lights to illuminate your subject so that the shadowed foreground will balance properly with the brightly sunlit portions. This is especially useful when you are making interiors during the day-time, with sunlit windows showing in the background. Normally, even a well-illuminated interior would receive so much less exposure than the brightly-illuminated view seen through the windows, that the latter would be grossly over-exposed, showing up as only a glare of white. By using lights on such interiors—even where they wouldn't be seen necessary—you can balance the exposure so that the result on the screen is really natural.

In conclusion, undoubtedly the best summary of the problem of lighting a set is found in the words of James Wong Howe, A. S. C., who has said: "Instead of approaching any given set or action with the question, 'How shall I light this?', I prefer to approach it with the thought, 'What compositions can I make with this set and this action?' Then I proceed to make those compositions—and the lighting automatically takes care of itself. There are of course scores of little tricks of lighting which help to give the effect of actuality. Every photographer or painter soon learns, for instance, the value of contrasted planes—

different degrees of illumination on background, foreground, and middle-distance—and of little catch-lights on curved surfaces, archways, and draperies—and the fascinating play of light and shade that always, by any means, shadow! And that is about all there is to say about the problem of lighting: make your composition, arrange your primary lighting to accentuate whatever may be the salient points of that composition, and to give a natural effect, arrange the rest of the lighting to carry out that idea, and to properly display your set and players and there you have your set lit!"

Exposure Meters Become Professional

(Continued from Page 221)

use good photographic sense. You cannot expect the meter to give you the correct reading of a scene at a great distance when the light in front of you is not the same as at that distance.

An exposure meter of the photoelectric type is influenced by the light immediately in front of it. If you are standing in the shadow and intend to shoot out in the sun, don't expect to get the right reading. Go out there in the sun and get the reading. If you are in the sun and your subject is in the shadow, get the reading at the camera, then get another reading right up in the shadows. Take the average. That's what you would do if you had a wide experience in photography and depended upon your judgment.

Let's say you are out in the sun and you secure a reading of objects in the shadow of F11 and up close you secure a reading of F5.6, I should say F8 would be the proper stop to use.

It's because of these things you must know that I say it is not a "fourja" board but you must use some of your photographic knowledge under various conditions.

I heard a story about an amateur recently, which brought quite a laugh, but it impressed on me what a mighty fine thing the exposure meter must seem to people of such little photographic knowledge. This fellow was using an orthochromatic film and was told to shoot it wide open. The shots came out rather well. He was shooting some beach scenes. When he said he had shot it wide open they asked him what stop he had used. He didn't know the figure but showed them in the camera. He had set his lens at F16 and thought it was wide open.

Many are of the opinion the professional is a bit too proud to use an ex-

Ten Common Mistakes of the Amateur

(Continued from Page 225)

of continuity. You see the 16mm home movie is an intimate picture. They are called personal movies, home movies and every other term that indicates they are intimate. So get intimate shots. The close-up is the most intimate picture you can secure.

Many fail to change their exposure for close-ups over a normal shot. You must open the lens from one to two stops for a close-up when there is no change in the light as compared to the exposure for a long shot on the same subject. The amount the lens will have to be opened of course will depend upon the light reflecting qualities the subject contains. The darker the subject the more you must open the lens.

We have merely sketched these faults and methods of over-come and correcting them. From time to time we will devote a complete article to their various phases so as to give you a more intimate understanding of what to do to secure better pictures.

posure meter. There may be a few, but many of those who are right up in the top ranks of studio cinematographers have adopted the exposure meter as a part of their equipment.

Amateur Moving Making in Europe

(Continued from Page 223)

In Germany the amateur is passing through a general reorganization, which is the consequence of the political revolution in that country. In Berlin the Bund der Film-Amateure E. V. has done splendid work hitherto and we are convinced that the leading men in the "Bund" will prove to be able to organize the enormous number of German amateurs, after the struggles for national reorganization have passed.

Belgium seemingly has entered a period of non-activity after several years of great prosperity. The Union Belge des Cinéastes Amateurs, Brussels is apparently at a standstill, but we hope this stagnation is only temporary.

In Hungary we have another full-active group of amateurs being organized in the Club of Hungarian Amateur Moviemakers Budapest, whereas Spain, Portugal, Switzerland are countries with steadily improving conditions. We are going to report on each country separately, showing illustrations of league and club activities. Our next article will be specially dedicated to Holland and the Nederlandsche Smalfilmings.

Recording Sound on 16mm Film

(Continued from Page 228)

centering, etc.

16mm film with one set of perforations is now available in all emulsions, including fine grain reversal, which permits the recording of higher frequencies than would otherwise be possible, inasmuch as the cutoff due to grain is about at 4500 cycles with ordinary films.

We feel that 16mm will achieve new heights and that by its availability will reach fields never before motion picture minded, since the cost of producing pictures was far too great for them. We do not think that 16mm sound will ever approach on those uses which are now served by 35mm film, but will be used for services such as the home, school, church, etc., which do not require the screen size and sound amplification possible with 35mm film.

Minneapolis Salon

The Second Annual Minneapolis Salon of Photography will be held at the Minneapolis Institute of Arts, Dec. 1 to 21. The closing date for entries will be Nov. 15.



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SOLITE UNIT REFLECTORS

Prefaced by the Light Wave from
Coast to Coast

Slow Motion Reveals Machine Defects

When, as often happens, a machine designed and built on apparently sound and proved principles just doesn't operate correctly, what can be done to determine the cause of failure? In such cases, design experts are now having recourse to the motion picture. They set the machine in motion and take "slow" movies of it as it operates. These movies reveal the behavior of mechanisms moving too rapidly for satisfactory observation by the human eye, and many baffling machine problems have been solved in this manner.

Says R. Fawn Mitchell, manager of the technical department of the Bell & Howell Company: "One of the first instances of securing increased efficiency in machine design by means of motion pictures had to do with a high-speed adjusting machine which jammed in the envelope in-feed. A mechanism outfit was arranged to take a close-up of the feeding mechanism with the feeding pawl painted white to facilitate following its motion. Motion pictures taken at 4,000 frames per minute disclosed that the feeding pawl vibrated at one time and not at another. Each time the pawl vibrated it failed to feed an envelope. Not only did the pictures show this effect, but they registered the time by means of a high-speed stop watch so that at least a reasonable approximation

of the duration of the oscillation could be obtained. With this information the designers were able to effect improvements immediately."

"One peculiar advantage that a designer gains by taking motion pictures of a machine may not be apparent at first sight," says Mr. Mitchell. "The motion picture camera is trained on just the essential field of action, and is viewed in a more or less darkened room free from distraction. As a result the attention is centered on the screen and the observer is not subjected to the many distractions of sight or sound which are a necessary concomitant to the actual machine. It is not always necessary to take slow movies to get results. Frequently ordinary speed movies will serve the purpose."

have been cut out not only to reduce weight but also to provide ease in threading.

New Combination Enlarging Device

● E. Lerts, Inc., announces a novel feature in connection with their enlarging apparatus. The popular Valley Enlarger can now be supplied with attachments whereby it may be used not only for making enlargements, but for reading manuscripts and projecting pictures upon a screen as well.

A special rotating film carrier permits the film image to be placed in any desirable position, regardless of the position of the film in the enlarger. A special box may be placed under the lens, whereby film records of manuscripts, legal documents, maps and book pages may be read with ease. On the front of the box is situated a ground glass screen, sloped at a convenient angle. A mirror within the box reflects the image upon the ground glass screen. The user need only seat himself comfortably in front of the screen and view the films, right-side-up and right-side-down.

When the enlarger is to be used as a projector for screen projection, a special mirror, mounted upon a universal joint so that it may be placed in any position under the lens, is attached to the enlarger. The image produced by the lens is thus projected upon a screen. The usual oil lamp in this case is replaced with a special clear projection bulb.

The feature of this equipment lies in the fact that with one unit the owner can enlarge, project and read his films with the utmost ease and satisfaction.

Counter Light Cap

● Hugo Meyer & Company announce the acquisition of the famous Worschung Counter-Light Cap manufactured in Germany. This light cap is designed to protect the lens when photographing against light rays when pointing the camera toward the light source and in some instances they claim it is possible to direct

16mm Camera Exposes Insurance

(Continued from Page 22)
ing it off himself and fighting the heavy down-town traffic.

Cases like this are increasing more and more every day. The insurance companies are learning of the great value of the 16mm camera with the present day fast film and fast lenses in detecting these frauds.

Some companies have equipped themselves with complete outfits just for this purpose. The Pacific Electric Railway company have an outfit of this nature. Other investigators are making this sort of detection a specialty for many insurance companies and some individuals are proving their entire time over to work with the 16mm camera for insurance companies.

Wheels of Industry

(Continued from Page 22)
projector, has been provided with 1200 and 1600 foot reel arms.

To be exact, 1200 feet of 16mm film at the rate of 24 frames per second (normal speed for sound), requires 33 1/2 minutes for projection, and 1600 feet 44 2-3 minutes. However, the statement of half-hour and 45-minute projection periods will probably be more generally used in this connection.

The new B & H reels are of all-steel construction. They have the B & H self-threading hub feature. The flanges

the camera toward the light source, when the source is not directly in line with the lens.

Acting in the nature of a sun-shade as it does with its added feature of an adjustable cap that can be placed in any position it would seem to have a fine flexibility.

Controlled Printing for Miniature Camera Pictures

(Continued from Page 214)

into the negative-camera of the enlarger pressed between the two glasses in a little pool of glycerin. This seems to help minimize the grain. It is always a good idea when you are making important enlargements, from any negative.

Now, there isn't much we can do about the scratch—yet—and of course we can't retouch such a small negative; but we can do a lot to improve the contrast-balance, by "dodging." This is simply interposing some opaque object between the lens and the enlarging-paper, keeping it moving, so that there will be no sharply-defined edge, and holding back the shadows while the highlights (that is, the denser parts of the negative) have a chance to print. You can do this with your hand, or a bit of cardboard. (This is convenient, for you can turn it to the shape you want,) or with one of the regular, glass-handled dodging-shields that the photographic-supply stores carry.

At any rate, take your time about making this master-print! get everything as perfect as you can—stop the lens down so you can get the maximum of detail, etc.—and make as many prints as may be necessary. the main thing is to get one print that is **just right**.

Then, get to work on this master-print, after it is developed, fixed, washed and dried. Spot out all the little pinholes, dust-spots, etc.—and don't forget to spot out the scratches and other blemishes. If you want to—and are good at it—you can even go over it with a pencil, building things up, or eliminating them, as may seem advisable.

After this, put the print in a copying-frame, and make a first-class copy negative of it—you can, of course, make this negative any size, but I would advise 8x10. Obviously, you can retouch this master-negative as much as you want to; and by this time, you should have a very nearly perfect negative of your final picture.

Once you have this perfect, enlarged master-negative, you can forget the original negative should embody practically all of the modifying work that is to be done in



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Library Subjects

Full, natural color movies without extra projection attachments of any kind, because the color is right in the film itself. No extra light is needed in your projector—the Dunning Natural Color can be projected to as large a size and with as full illumination as your black and white pictures.

Two library color subjects—"Hawaii's Lake of Fire" and "In the Blackfoot Country" (each approximately 100 feet) can now be supplied by all better dealers at \$9.00 each. New releases will be issued each month. Patronize your local dealer.

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order to make your original negative into the finished salon picture you want. From it, you can make either contact-prints or enlargements of uniform quality. If you can easily standardize your procedure in making these final prints, and duplicate your prints in every detail at final, miniature-negative, for the master-

any time). By this method, you have almost unlimited control over your picture—and, best of all, you embody all of the controlling operations in the enlarged master negative; once this is as you want it, you can be assured that every succeeding print will be exactly perfect.

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COMPLETE WITH Filter and Effect Devices

A unique accessory containing a Bagday Filter Holder unit and equipped with 5 21 square filters sealed in optical glass. Two filters serve the purpose of normal correction, nearlight, fog effect and distant shot, one diffusion for portraits and close-ups are for heavy diffusion and one for diffusion. Its which shows a clear portion merging into diffused edges. Keyhole and circular masks together with square opening and closing. Its effect are also included. Other effects such as heat shimmer, star in particle are easily controlled by the amateur.

This device differs radically from similar accessories in its ability to hold standard 2 1/2" filters. marks snap-outs etc. at a far enough away distance from the lens to avoid blurring of distance on the film. The filters may be also used behind the hood.

Substantially made, light attractive in appearance, this is a standard unit which fits on any lens. Carried from 1 1/2-in and under. Since this valuable accessory is so very moderately priced, there is no reason why the amateur should deprive himself of the possibility here offered to gain all the professional effects which it can confer. Send for detailed literature and for complete list of other filters suitable for this device.

\$8.50

Burleigh Brooks

127 West 42nd St. New York



Positive Control Data

(Continued from Page 215)

negative gamma plus the toe density. By toe density is meant that value of density at which the toe departs from the straight line characteristic of the sound negative H and D curve. Thus if the Type 11b negative gamma equals 0.40 and the toe density equals 0.15, then the correct operating density would be 0.55.

In the case of positive density a value that will not permit much operation into the toe region is recommended. This depends upon the shape of the toe of the printer H and D curve. Experience has shown that a visual print density in the neighborhood of 0.70 for a gamma approximating 2.00 is usually satisfactory. Some studies that fail to obtain a correct overall gamma of unity have recourse to lighter prints varying in density from 0.50 to 0.60. Based on observations, the following specifications cover most processing of light value records:

Negative Gamma	0.35 to 0.40
Negative Density	0.50 to 0.60
Positive Gamma	1.80 to 2.20
Positive Density	0.65 to 0.75

Before any recommendations for processing are made to any studio by the Western Electric Co., or its subsidiary the Electrical Research Products, Inc., the entire sensitometric control setup from light valve to photo-electric cell is examined. All of the above recommendations regarding Western Electric track control are quoted from data obtained from representatives of the Electrical Research Products, Inc., in Hollywood.

In considering developers for sound track work it is necessary to realize that recordings are made on film which contains an emulsion of positive characteristics. As can be seen from the specifications quoted above, the gammas desired are very low. It becomes necessary, therefore, that a developer of low contrast characteristic be used. Quite often use is made of the picture negative formula. However, slightly better results are obtained with a developer quite similar to the picture negative formula but with a smaller quantity of sodium sulphite. A typical formula used for

the development of sound negative of the variable density type is given in Table 7.

TABLE 7

Sound Negative Developer	
Elen	1 lb
Sodium sulphite	46 lbs 8 ozs
Hydroquinone	2 lbs 3 ozs
Borax	1 lb
Water to	120 gals

It is quite obvious that the formula used for developing the positive sound track is identical with that for positive picture inasmuch as the final print contains both the picture and the sound track.

In closing the author would like to express his appreciation to the individual representatives of practically every studio and laboratory in Hollywood, as well as representatives of the major sound units for the assistance which they rendered in the compilation of the data presented in this paper.

(1) L. A. Jones, JSMPE, 15 October, 1931, p. 536

(2) Capstaff & Purdy, JSMPE, 11 September, 1927, p. 607.

News Cine Photography Is Different

(Continued from Page 216)

may be getting negative film seventy-five or a hundred different cameramen from seventy-five or a hundred different parts of the world. Believe me it's a rush and a jump to put all the stuff through the soup and make prints, cut, edit, title and arrange the material. There are no dailies in a news lab, and no re-takes for the boys. So taking all this into consideration it would slow up the speedy progress of changing the dark room lights from ruby to green, if one can had straight stock and the other had super-pan or grey back.

Gradually as time passed on, and sound came in faster film was used, I doubt very much if today Ortho is in use. Maybe so.

Filters outside the "K" were never used because film was rarely developed for much detail, as for diffusion and the use of discs in close-ups, no time or thought could be given to that technically. Perhaps no thought has been given to their use. Maybe if some newsreeler applied diffusion to his photography and continued the practice, the rest of the gang might follow, and perhaps some day we will see news photography in the same category as that of production, I doubt it.

Lee Garmes, A.S.C. Weds

Lee Garmes, A. S. C., became a bachelor on September 10th, when he married Miss Ruth Hall. The ceremony was attended only by intimate friends, John Arnold, A. S. C., originally scheduled to serve as best man, was unable to be present as he was called to the NRA conference in Washington. Mr. Garmes is at present photographing "I Am Suzanne," starring Lillian Harvey, after which he will make his debut as a director.

Modern Photography Annual

It is always a delight to have the latest issue of "Modern Photography," annual come to our desk. The 1933-34 Annual devoted to Studio Photography has reached us with its wealth of fine examples of modern photography from all countries of the civilized world.

The photographic subjects reproduced are so wide in their scope, treatment and subject matter that practically everyone who is devoted to the camera will surely find something in this annual that will have an especial appeal to him and a great deal of fine material which he can study to splendid advantage.

Modern Photography is given over almost in its entirety to reproductions of fine examples of photography. Only four of its 128 pages are given over to text. Modern Photography is edited by C. G. Holme and published by The Studio Publications, Inc., of New York City.

Stolen

The following items were stolen from the Fearless Camera Company, 8572 Santa Monica Blvd., Hollywood, Calif. Bell & Howell Camera No. 910, equipped with Fearless movement. A 35mm Fearless Camera, no serial number, the only 35mm Fearless Camera ever built, 2-1-15 horse power Bodine motor; 3 Mitchell Upright View Finder; 7 Camera Lenses and 1 Graflex Camera. Anyone knowing anything about any of these items please advise Fearless Camera Company.

Burns With Bennett

Herbert E. Burns, formerly with Nisch & Kaye and Schwabacher Frey of San Francisco has become associated with Gordon Bennett in conducting the Hollywood Motion Picture Supply Company, dealers in photographic equipment.

Burns is widely experienced in the photographic trade having been aligned with the industry for the past fifteen years.

Chicago Club Meets

The Leica Club of Chicago held its regular monthly meeting on September 8th at the Stevens Hotel. The club had the pleasure of hearing Messrs. Kerwin and Mansfield, both members of the club. The former delivered a lecture, illustrated with slides, on some 49 com-

Leica offers you Your Choice of Accessories for Every Special Photographic Need

One of the most valuable features of the LEICA Camera is the extraordinarily complete line of accessories that is offered in conjunction with it. LEICA's interchangeable lenses including telephoto, wide angle, telephoto lenses, and others are of course too well known to need elaborate introduction. They offer unparalleled advantages of economy, convenience and versatility. The LEICA line of photographic accessories offers these same advantages extended to many types of photographic work. They convert the LEICA into a movie camera, copying camera, clinical camera, 35mm camera, and many others. There are LEICA printers, enlargers, and projectors, too.

These Leica Accessories Can Be Used With All Miniature Cameras

New "8-in.-1" Combination Engraving — Reading — Projection Apparatus

Lower Combination Printer for film and glass slides

Udimo Projector for all miniature cameras—single frame LEICA slides and Double frame 344 cm. or half vest-pocket size. Uses the LEICA Camera's standard ELMAR 1:3.5 lens.

Velo Enlarger for all miniature cameras including Leica—also uses LEICA'S 1:3.5 lens.

"LEICAMETER" Exposure Meter tells you correct exposure instantly for use with LEICA and all other still cameras.

Write for Technical Bulletin 10 describing LEICA Engraving, Reading and Projection Apparatus. Also full information about the LEICA Camera and accessories will be sent.

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Automatic focusing with built-in short time range finder. Outwork eliminated. Focal plane shutter with greatest range of speeds on any camera—1 sec. and 1/2, 1/4, 1/8, 1/16, 1/32, 1/64, 1/128, 1/256, 1/512, 1/1024 and 1/2048th second. 36 pictures from a single roll of 35mm film. Sharp negatives—enlargements up to 12x18 inches or more. Small, compact. Fits the pocket, easy and fast to operate. Write for booklet 1214 describing LEICA MODEL F also illustrated booklet "Why LEICA?"



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mon amateur faults explaining in each case how they might be avoided. Mr. Mansfield followed with a talk on fine grain developing thru the use of Paraphenylene-Diamine developers. His discussion was based on material dating back to about 1890 when the above developer was first used, also on the result of actual tests made with the various Paraphenylene-Diamine developers recommended. To more clearly illustrate the possibilities of this fine grain developer he displayed several enlargements

made from portions of negatives enlarged 35x and 70x with hardly any sign of grain. One of the prints measured close to 5 feet. The results obtained with this developer are sometimes unbelievable.

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KIN-O-LUX
The only film that continues to develop between the sprocket holes, during exposure in bright sunlight. No need of darkroom or special conditions of light and heat occasionally found in the light suggest the use of KIN-O-LUX No. 2—a faster film and only a little more expensive.

No. 1—100 ft. in green box	\$3.00
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Including Processing, Research, Freezing and Retain Postage

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Mechanical Engineering Applied To Lenses

(Continued from Page 211)

lens axes and due to the emerging wavefronts not being surfaces of revolution. The problems of design are therefore immensely more complicated with photographic lenses than they generally are with other optical instruments.

The three lens systems shown in Fig. 1 were due to the genius of Mr. Dennis Taylor of Messrs. T. Cooke and Sons of York, under whose name such lenses have always been known, although made at Lancaster. His genius produced a form of lens system with aperture f-3.5 comprising only three glasses but performing in all respects as well as, and in some better than, contemporary lenses of more elaborate construction. Fig. 2 shows a lens system, aperture f-4.5, originally devised for photography from aircraft. Figs. 3 and 4 show lens systems both with apertures f-2.

Fig. 5 shows a group of finished lenses of various optical designs adapted for different special purposes. Fig. 6 shows a large photographic lens used for photographing star fields.

It has been usual, for reasons which we shall appreciate later, to employ only spherical surfaces in lens design. Astronomical telescope objectives and some others have, however, been "figured" by removing additional material from selected zones or areas of the lens, generally by additional polishing, to perfect the performance of the lens. But this is very laborious work unsuited to the commercial production of photographic lenses generally. Nevertheless it is possible that the next great step in photographic lens design will involve the use of aspherical surfaces; but this cannot be effective until the mechanical engineer has provided means for producing such surfaces commercially with an order of accuracy of, say, 0.00001 inch.

Optical Glass.—The properties which make glass essential for lenses are its transparency, homogeneity, and permanence; the fine polish it will take and retain; and the variety of optical properties (refractive and dispersive indices) available according to its composition. Optical glass has been specially made as such since 1827 by Mantos in France and by Chance Brothers in Birmingham since 1846. About 1891 its manufacture was started in Jena to provide new materials for Professor Abbe's microscope objectives. During the War a second English factory was established in Derby, and its control was acquired after the War by Sir Charles Parsons. Two among other things was an astronomer and son of the celebrated astronomer Lord Rosse, who

desired especially to produce large disks for astronomical objectives. Optical glasses of the very finest qualities are obtainable in this country from either Birmingham or Derby.

In producing optical glass, the necessary silicate base is fused in a crucible together with the metallic salts which give the glass its special optical properties and the mass is slowly stirred by a mechanically operated stirring rod. Difficulties to be avoided include contamination from pot and rod, segregation of the glass constituents and the inclusion of bubbles and dirt. As it has not been found practicable to extract the finished glass in a plastic state from the pot, the whole is permitted to cool slowly and then broken up with a heavy hammer. The pieces of pot are knocked off the lumps of glass, the useful lumps of clean glass are selected and reheated on the sand-strewn floor of a furnace until they are plastic, and are then pressed either into the form of thick plates or, between suitable moulds, roughly into form of lenses. The material is then annealed, perfect annealing being essential; and this is a slow process owing to the low heat conductivity of glass.

Fig. 7 shows four typical pieces of raw glass plate, the largest polished on both sides and two others being the original batch number.

Since each pot of optical glass has a distinct individuality, and differs appreciably from every other pot of glass, the moulded pieces from each pot are stamped with a distinguishing number and their identity is preserved through all the subsequent processes of manufacture. In order to ascertain whether the glass is perfectly annealed and free from bubbles and dirt inclusions, it is the best practice to grind and polish the plates on both sides and then to view them by transmitted polarized light, as is done by Professor Coker with his celluloid models.

Charles Clarke, A.S.C. To Mexico

Charles G. Clarke, A.S.C., the Second Vice-President of the American Society of Cinematographers, has been given one of the best photographic assignments of the year. The Metro-Goldwyn-Mayer Studio has assigned Mr. Clarke to direct the photography of "Viva Villa," starring Wallace Beery and Mona Maris, under the direction of Howard Hawks. This will take Mr. Clarke to Mexico for the next three months. During his absence, Ray June, A.S.C., has been appointed a member of the Society's Board of Governors to serve in Mr. Clarke's stead.

PHOTOGRAPHY of the Month

"MELODY CRUISE"

An R-K-O Production

Photographed by Bert Glennon

Special effects by Vernon Walker, A.S.C.
and Lynne Dunn.

This is one of the most ingeniously-made musicals to emerge from an American studio, lacking only two elements—an outstanding "hit" song and a real singing screen personality to sing it—so put the film into the smash-hit class. As it is, the picture is excellent entertainment, and thanks to directorial treatment patterned after the Rene Clair and UFA-musical schools, in which musical and filmic rhythms are cleverly combined, it is of real worth to students of screen craftsmanship.

Bert Glennon's photography is extremely pleasing, he has gotten his hand well in again after his long vacation while directing. The outstanding feature of the film, however, is the special-effects work of Vernon Walker, A.S.C., and Lynne Dunn. "Melody Cruise" might, in fact, be better described as a solo for Optical Printer, accompanied by a film-troupe. Practically every transition in the picture is done on Meters. Walker and Dunn's Optical Printer—and they have not only used every trick hitherto imaginable, but invented half a dozen or so new ones of their own. It would take a complete volume to catalogue even a few of these clever transitions—wipes, blends, whirls, melts, and the like—so the only thing to say is if you want to see what a clever man can do with an Optical Printer, see "Melody Cruise." But—let's hope this doesn't start a cycle of weird optical transitions, they suited this picture, but they would not by any means suit every story, musical or otherwise.

"REUNION IN VIENNA"

A Metro-Goldwyn-Mayer Production

Photographed by George Folsey, A.S.C.

Excellent entertainment for both eye, ear and brain, "Reunion in Vienna" is, cinematographically speaking, a first-class illustration of Cinematographer Folsey's recent article on photographing white sets. Practically all of the important action takes place on pure white sets, and Folsey's decorative set-lighting uses these backgrounds as canvases upon which he skillfully paints with light and shade. The result is more than pleasing. As usual, Folsey's treatment of the players is equally artistic—especially in the case of Diana Wynyard. The film is also

of more or less historical note as the first known screening of John Barrymore's know as much how to tone down a star's inordinate charm or attractiveness as how to enhance it, comparatively unknown left profile! It serves an excellent dramatic purpose, however; and demonstrates that there are times when a cinematographer must

"I LOVED YOU WEDNESDAY"

A Fox Production

photographed by Hal Mohr, A.S.C.

This production is in every way magnificent (there is an anglo-saxon word even more applicable), and is an excellent object-lesson in the folly of the co-director system. For one of the co-directors has apparently striven throughout for simplicity, while his fellow has gone out of his way to achieve super-sophistication and bizarre effects. This situation has naturally affected Hal Mohr's cinematography, which is, per se, straightforward and bizarre by turns, though always maintaining Mohr's accustomed technical excellence. It is unnecessary to note the technical means used to attain Elissa Landi's much-publicized "change of personality"; exaggerated lip-makeup and "harder" lighting.

The highlights of the film—photographically speaking—are the ballet and Boulder Dam sequences. The first is a very effective (and artistic) presentation of a difficult subject, and indicates what can be done in this direction by intelligently co-operating cinematographers and ballet-masters. At no time in this sequence is one conscious (as is so frequently the case in dance-sequences) of the limitations of the screen composition, lighting, staging and cinematography. The sound-recording throughout is below the usual Fox quality, the problems of the recorder having obviously been heightened by extremely inept dialogue-direction.

"F. P. ONE"

Gaumont-British UFA Production,

released by Fox.

All Technicolor Credits Omitted.

Fox has seen fit to omit in its entirety the technical credits on "F. P. 1"—a practice that is wholly unjustifiable under any circumstances, and doubly so in this instance, for it is the outstanding work of the Cinematographer and the Art-Director which will make this film a

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success "F. P. O." is technically excellent in its own right—and doubly noteworthy as the first foreign-made production in the memory of this reviewer to be shown in this country in the form of a first-class print, rather than an inferior "dupe." Both the photography and the sound are in every way comparable to those of American pictures; in fact, one has frequently seen worse camerawork in domestic films, and heard worse sound.

A good part of the action takes place on one of the huge floating landing-fields soon to be anchored in the middle of the Atlantic Ocean as a base for transatlantic air-traffic. (One such bona-fide "floating platform" is actually under con-

struction in this country today, so the thesis of the film is by no means fictive.) The set used to represent this in the film is in itself a technical achievement of note, as it was built in actuality on an island in the Baltic—and built well enough so that airplanes actually landed on it, and took off from it. Cinematographically speaking, the work is excellent, even to the aerial scenes, which, by the way, were the only dupes in the entire production.

In common justice, however, Fox should give credit where credit is due, and inform American audiences who were responsible for the excellent technique of "F. P. O."

Economies In Sound Film

By Gerald M. Best**

It has been customary at the Warner Bros. Studios to process only the "choice" scenes of picture film, retaining the "NG" and "hold" scenes in storage at the laboratory until it is determined that they will not be required, after which the film is disposed of as scrap, or fogged and used for leader. Until recently, the sound track negative, however, was processed in its entirety, the "NG" and "hold" scenes being set aside after processing, and stored in vaults until the end of the production season. It was not considered advisable to break into the rolls of undeveloped sound track to remove the selected scenes, due to the possibility of damaging the negative in handling.

Hence, at the end of a production season there would be several million feet of sound track negative stored in vaults, for which there was no use. In order to avoid this waste, a system of pre-selecting the takes, first introduced at the RKO Studios in Hollywood, was adopted at Warner Bros. Studios, and a most gratifying saving has been achieved with no delay in film processing, no impairment of sound quality, and no expenditure for new equipment or modification of existing equipment.

The "NG" scenes are placed in containers marked with the numbers of the rolls from which they were removed, and such other information as is needed to identify them should they be required for reference or emergency. The "hold" scenes are placed in other containers marked and stored in vaults under the name of the picture for which the film was recorded. If at the end of 72 hours the "NG" scenes are not called for, they are removed from their containers, spliced into 1000-foot rolls and used for print-

ing dailies, etc. As three feet of film ahead of each scene is fogged when operating the recording machine, this length of film is torn off and discarded.

The splicer has been so adjusted that the scraper does not remove the emulsion over the full width of the patch, but leaves a very small margin on each edge so that there will be no white lines of clear film after the patch has been made. This avoids annoying "pops" in reproduction, and unless the reproduced volume is very great, the patches are not ordinarily audible.

Due to the fact that different emulsions are used in recording, during any period of several months or more, the emulsion number is marked on each roll of film sent to the laboratory, so that each roll of spliced stock can be made up of sections of the same emulsion. If different emulsions are spliced into the same roll, spurious variations in print transmission are likely to occur due to differences of speed of the several emulsions. By printing all the dailies with the picture aperture open, the negative track is practically entirely fogged out, so that there is no danger of confusing it with the positive track on the opposite side. Even if the negative track is not fogged out by this means, it can still be readily distinguished, as it becomes extremely dense due to the high gamma to which it is developed.

The "hold" scenes are stored until the picture has been released, or occasionally in the editing of the picture, the action or sound in a choice scene is not suitable; in which case the "hold" scene is ordered protested for inclusion in the picture. When the picture is released, the "hold" scenes not called for are removed from the vault, spliced into rolls as are the "NG" scenes, and used for printing, thereby using all the film that was not originally processed.

The saving represented by the pre-selection method has been quite appreci-

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able. A total of 4,250,000 feet of positive raw stock was purchased, and of this, 3,100,000 feet were used on actual production, 940,000 feet for music score, dubbing, sound effects, voice tests, etc., and 90,000 feet for recording tests and miscellaneous requirements of studio production routine.

Of the 3,100,000 feet of production recording, 1,487,000 feet were used in choice takes, processed and printed. "NG" or "hold" takes comprised 1,622,000 feet, the "NG" scenes becoming immediately available for splicing and printing dailies, and the "hold" scenes becoming eventually available. Thus a surplus of 135,000 feet over the amount of film required for printing the dailies was created, to which should be added the "NG" takes of music score, dubbing, etc. Allowing a 3 per cent waste in splicing, and deducting a small number of "hold" takes later ordered processed after being held for some time, a substantial quantity of spliced stock is thus left over for other uses, such as drape picture prints occasionally required in dubbing and music scoring, or for conditioning the developer in the laboratory. The only new print stock purchased during the season was for printing music score, sound effects, and other material used in dubbing, where spliced stock would not be suitable due to the possibility that the splices might interfere with the music or the effects.

On this basis, at a cost of 1 cent per foot, it is obvious that an actual saving of more than 50 per cent of the purchase price of print stock was effected, and to this must be added the saving in processing costs, due to the fact that less than half the negative sound track formerly processed is now put through the negative developing machines. It was found that one batch of developer lasted at least 50 per cent longer than before, on account of the smaller quantity of negative film processed, and the saving in chemicals, power, and general laboratory overhead amounted to several thousand dollars during that time. The new method did not reduce labor costs in the processing, as the personnel released from the developing machine crew due to the smaller quantity of film processed was put to work breaking down the film before processing. It did, however, eliminate the large amount of labor required in sorting out, storing, and finally throwing out the millions of feet of "NG" and "hold" scenes that had been processed and stored throughout the season, and incidentally the problem of film storage space has been materially simplified.

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Voice and Personality
In the Motion Pictures

Jack L. Bradley**

In the days of the silent motion pictures it seemed to us that the personalities of the actors were more vivid. The acting was perhaps not so smooth, but the actors conveyed to us more of themselves. They had to, for they had only the visible expressions of face and body with which to appeal to our eyes and emotions. We received the impression and remembered it. In some respects Charlie Chaplin is wise: you do not forget him, you always see him in front of you and can recall his image immediately. If you stop to think of it, you will find you can still easily recall certain personalities of the silent film. They could not then rely upon the sound effects which are today so important; they had to make an effort to convey themselves clearly and completely by visual means alone. The majority of my friends seem about equally divided on the subject, but feel that while pictures today have attained a greater dramatic value, the personalities were more vivid in the silent films.

The cacophony that came from the screen between the days of the silent film and those when sound effects became tolerable so lacerated our nerves and taxed our endurance that in our relief we have perhaps forgotten how we felt about the silent film. Then came this immediate and imperative need to charm the ears as well as the eyes of the public. Let us admit at once that the motion picture industry has met this need more quickly, in a more progressive and, let us hope, more scientific manner, than any other group having a vital interest in the field of vocal education. However, in attempting to change so quickly their concept of the movie actor's voice, the motion picture industry has lost sight of the most important element for enhancing the beauty of vocal tone.

It is certain that the public, and perhaps the motion picture producer, is aware that some subtle essence is slipping from some of the artists that no one yet seems to have been able to discover, for very many movie stars gradually slip down the same decline. One actor after another enters Hollywood a vital human being, only to become in a year or two a frozen creature who knows how to slither across the floor as the world's most perfect mummy, carrying her clothes perfectly, setting the fashions, displaying emotion in artificial, cold movements, soaking with an artificial, cold voice—they are all alike, the same

mannerisms, the same manner of speech, the same kisses. The public is so tired of it, and I should think that the engineers who have to look at it every day, year in and year out, would explode in righteous wrath.

To begin with, it is criminal to suppress the natural release of genuine human emotion and to cover it with a meaningless artificiality. Have you forgotten that real, sincere emotion is so much more beautiful? Ruth Chatterton used to thrill us, and we rushed to see her, now she is little more than her clothes. "She has lost something," the people say. Norma Shearer is undeniably lovely, especially in "Smilin' Through"; but she is always the same, and makes one feel that she is so conscious that every move is beautiful, that she works day and night, constantly, to improve the perfection of her every line and gesture. She is a perfect example of superficial beauty; nothing is ever disturbed, not even a hair. Her facial expressions, even when she is supposed to be deeply moved, are always calculated not to disturb her external shell of beauty. Perhaps she works in a room lined with mirrors, but so did Isadora Duncan, and she still retained her positive, creative vitality.

Now let us turn to Katherine Hepburn—a vital creature, certainly. In "A Bill of Divorcement" she was strong, dramatic, magnificent raw material. I ask you, what are you going to do with her? Even in her second picture she has already lost some of her spontaneity. She has apparently two personalities: one masculine, with angular movements and a hard masculine voice, the other feminine, with a truly beautiful emotional feminine voice. The masculine expression is a self-developed protection for her emotional sensibilities. I believe that if we could have an intimate talk with her we should find the roots of that protection in some bitter hurt to her soul in childhood, or in some childish desire to emulate the masculine virility of her brother. To try to eliminate the hard exterior by developing an artificial feminine sweetness will not solve the problem. Her real personality is expressed by the rich, emotional feminine voice that she uses only a few times in the picture.

I have been told that without a doubt the producers realize that they have made a mistake in so quickly elevating her to stardom, and that now she is making another father-and-daughter picture with John Barrymore. I presume she will have to make father-and-daughter pictures for the rest of her life! And the New Movie magazine has already labelled

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**New York, N. Y.

fer "The Fashion Corner." Could anything reflect so distally on the motion picture industry than that it should have degraded the finest material it has had in years to the level of a "fashion corner?"

In Katharine Hepburn the motion picture industry has the opportunity to develop an actress on a new basis. Instead of tossing her down, it should be the privilege of the producers to help her to become aware of those two distinct expressions of herself, explain why they exist, and help her to realize the fine emotional value of her real self and show her how she might bring to greater fruition this undeveloped essence of her personality. She stands at the crossroads; a strong, individual character, and if the cinema finally succeeds in training her, and forcing her into just an empty shell of herself, they will have killed a soul and impoverished themselves and the public.

Clara Bow is another example of an emotional actress being forced into an artificial mold. In "Call Her Savage" there was a disturbing mixture of rather unconvincing rough behavior, artificial deportment, and beautiful, deep, sincere emotion. I came away from the theatre somewhat saddened, saying to myself, "If they'd only leave that girl alone!" You may smile, but my mind at once went back to *Eleanora Duse*, remembering her perfect balance of rhythmic silence, movement, and emotion; and there were moments in "Call Her Savage" when Clara Bow also had that. Her voice is not pleasant, but she has all the material for a very emotional voice. I found that I liked the fundamental Clara Bow, that she was fine and womanly, and at heart a true actress. But will the movie producers insist on this artificial stylization, or help her develop this very rare rhythmic instinct of hers?

Now the motion picture industry seems not to have succeeded in killing the soul of Greta Garbo—she fought to keep it. And in trying to make 250 imitations of her movie people forgot that it takes something more than a Garbo exterior to make another Greta Garbo. She is what she is because she has kept her fundamental being inviolable.

Then we have these remarkably open and frank personalities: Ida May Oliver—beautiful technician, and yet a human being; Mae West, the true vampire—I never have been able to understand why producers consider cold, artificial creatures vampires; Helen Hayes—exquisite personality and fine technician; Billie Burke—the most gracious lady in "Christopher Strong"; Leslie Howard—supreme in every way. And just look at what Gary Cooper is doing: He spoke so completely from the depths of himself in "Farewell to Arms" that we almost forgot it was

a screen production. You will notice that all these actors and actresses have a voice in keeping with and expressive of their personalities. They may change it to suit different characters, but they themselves have attained a great degree of integration of their being. They are artists sufficiently strong in themselves to resist an external artificial stylization; but others are weaker, and are swamped by this peculiar style of deportment training and direction.

Professor Overstreet has pointed out that "the artist is first of all a human being, and the quality of his art must be related to the quality of his personality. Such a point of view saves the artist from being a creature of pretty tricks and accords to him the high dignity of being a revealer of life." So the problem of the actor is not only to learn a physiological technique, but to develop and organize that subjective power that is the heart and core of the artist's being. To keep alive this center of one's self, to expand his spiritual understanding, should be the primary study of the artist. It is the substitution of mechanical technique, or of "pretty tricks," that has brought artists of all kinds to the present state of emotional mutilation.

Let me insert here a criticism of the last recital of John Charles Thomas that appeared in the *New York Times*: "Yet despite all this, i. e., the beauty of his voice, one sometimes felt a curious lack of penetration into the inner significance of the leader. The voice, for all its extraordinary beauty, seemed to traverse the surfaces of the music rather than translate into sound its more searching significance." Anyone who understands the relation of posture to voice would expect nothing more than just that, from the very manner in which John Charles Thomas struts across the stage. It is one more demonstration of the mechanical cultivation of a magnificent voice without a simultaneous integration with the inner personality.

This brings us to the relation of bodily technique to artistic expression, a relation that is highly important, for only through a rhythmic coordination of physical and mental energies can one attain a harmonious integration of one's being.

Let us return to Katharine Hepburn and her dual personality: her masculine phase finds its physical expression in a depressed forward larynx, a slightly protruding jaw, and a rigidity of breathers, sides of the neck, and roof of the mouth. All this results in a hard clipped, dry masculine voice. When she becomes emotionally feminine she releases all these contractions and permits the breath to flow freely into the head so as to produce rich overtones. The prevailing speech training does not change such



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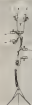
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conditions; it devotes itself only to phonetics, which enable the actor to speak clearly, with the proper enunciation, but allows him to retain his peculiar vocal defects.

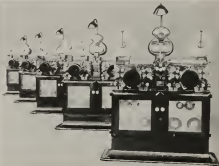
And again, take Carol Lombard. Several months ago, when this paper was first written, she was accustomed, when speaking, to throw her jaw forward so far as to be ugly, her larynx was pressed so far forward, the fauces and palate pulled down so hard, the back of the tongue so thick and low in the throat, her neck so distended, as to be a serious menace to her appearance. Miss Lombard, however, is a fine example of how we can change. Last week I thought I had better go to see her again and check up on her. Imagine my surprise to find that the lady had corrected her former faults to a very great extent, with the result that the voice was no longer so husky, but clearer and more expressive of herself. People imagine that a protruding jaw is something they were born with, and that it can not be changed. That is incorrect—it can be changed, but in her case, as in most others, it was a habit of speech, and when the jaw is brought back into the proper position the pressure on the tongue and larynx is released and they fall into a position for flexibility and consequent melody and beauty in the voice.

The vigor and power come into the voice from the floor of the pelvis, which generates an internal rhythmic flow of breath for the production of tone. In

the motion picture industry this is understood fairly well, because everyone keeps himself in such excellent physical condition, which is naturally conducive to vocal power, but it is made use of only in a very shallow manner. For in the majority of actors the breath-power never penetrates to the head centres, where the overtones and real richness of voice are produced. It is dimmed back by the rigid palate and fauces, which choke the personality as well as the flow of breath. We might well think of a securely corked champagne bottle, with all its bubbling effervescence unable to find release for the stoppage in the neck. So it should be clear that the physical coordination of all the parts of the body for the production of rich, sincere emotion and beauty in the voice is the physical correlate of the psychological coordination required for the release of the personality. The finished artist is the unity of these two.

The motion picture industry may feel that this coordination of the physical, mental, and emotional phases of the actor's being toward a unified expression of his personality is not their job. Perhaps not, nevertheless they did undertake the responsibility of repressing and eliminating the vital personality from their young actors by forcing them into one uniform, standardized mold and pattern of behavior. Now let them turn about and lead in the development of the integrated personality of their rising artists.

Battery of Bell & Howell automatic sound and picture production printers now being installed by M-G-M at Culver City, California. An article by Jas. Dukey, A.S.C., covering this printer, in considerable detail appeared in a recent issue of this publication.



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Preselection of Takes

By David W. Ridgway**

In recording sound on film for motion pictures, many takes are usually made on a single roll of negative. Some of these takes are good and are chosen to be printed, others are unsatisfactory. Previously to the adoption of the method described in this paper, all takes, good and bad alike, were developed, whether prints were to be made of them or not. The only exception occurred when no satisfactory take was made on a roll of film, in which case the entire roll was held undeveloped. After development, each roll was broken down and the takes to be printed were separated from the rejected, or "out," takes. The film that had been exposed on unsatisfactory takes and the cost of developing it were wasted.

By separating the good from the bad takes before development, two savings are made possible. In the first place, the cost of developing film that is not to be used in the finished product is avoided. In the second place, owing to the fact that the sound track occupies only a very narrow area near one edge of the film, the film may be reversed and spliced together, and prints for rushes and editing purposes may be made on the opposite edge.

Method.—The method described was suggested by the writer and is now being used on sound film at RKO Studios in Hollywood. The application of the method to picture negatives and the additional problems involved will be discussed later in this paper.

It has always been customary to expose a ten-foot strip of film to be used by the laboratory for determining development time at the beginning of each roll of sound negative. When takes are to be selected before development, a test strip twice the usual length is exposed. Half this test strip is sent to the laboratory with the takes selected for development, and the other half is retained with the "out" takes, to be used in case any of the latter are later ordered to be printed.

Between takes a notch is punched at the edge of the film. Each take is identified by hand-punched marks designating scene and take numbers. The oper-



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ator on production makes two sets of reports, one enumerating all the takes that were shot and the other only those takes that are chosen to be printed.

Equipment.—In the breaking-down operation, a small amount of inexpensive equipment is required. The room in which the film is broken down is the usual positive darkroom. It is lighted, however, by a Wratten series OA yellow safe-light, which affords sufficient illumination to render easily legible not only the pencil writing on the reports attached to the film magazines by the recorder operator, but the punch marks

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that identify the individual takes, as well. A special film rewind, which accommodates simultaneously two separate rolls of film, is used. On one roll are wound the takes selected to be printed,

*Reprinted from September 1933, 5 M P E Journal

**RKO Studios Hollywood, Calif.

Sound is recorded on positive stock (1) because it costs only one cent per foot as compared with the usual cost of four cents per foot for negative (2) because it has a fine granular characteristic. The positive stock upon which the original sound record is made, is of course the sound negative from which, in turn, prints are made. Prints are also made on positive stock.

*Experiments were undertaken and the system was placed in practical operation under the direction of the RKO Technical Consultants, composed of Alexander C. Dreier, J. V. Marone, W. R. Hinton, J. Wilkinson, J. Swann, F. Garbutt, L. S. Clark, and John Carr.

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Hal Rosson, A.S.C., Marries Jean Harlow

Another cinematographer-star combination has become a permanent institution. Hal Rosson, A.S.C., who has photographed Jean Harlow in many of her recent productions, recently surprised his friends by an airplane elopement to Yuma, Arizona, where Miss Harlow became Mrs. Rosson. Returning to Hollywood, they proceeded with the final scenes of "Bombshell," Miss Harlow's latest production, after which they plan a honeymoon in Honolulu.

and on the other the rejected or "out" takes. One-half the exposure test strip is separately wrapped and put into the can with the film that is to go to the laboratory. The remaining part of the exposure test strip is put into cans with the "out" takes.

The operator who breaks down the film, wearing gloves so as to avoid making finger-prints, allows the film to pass between his fingers, stopping the re-winds whenever he comes to a notch between the accepted and rejected takes, and each take is wound on its proper spool. No attempt is made to splice takes together in the break-down room. All film to be developed is spliced at the laboratory, where film to be processed is checked for any weakness or breaks and where any film weakened by notches is strengthened.

Risks.—In breaking down the pre-developed negative, there are the usual hazards incident to handling and processing film: (1) scratches and rubs, (2) static, (3) breaks in developing tanks due to faulty splices, (4) abrasions of sprocket holes and edges of film, (5) fog, and (6) dirt.

Precautions.—The danger of scratching and rubbing may be minimized by carefully handling the film and by taking care not to wind it too tightly. Static may be largely avoided by rewinding the film slowly. Little difficulty has been encountered in the form of splices breaking in tanks. The possibility of abrading the film at the sprocket holes or at the edges has not proved to be great. If the darkroom is properly equipped, the danger of fogging is insignificant. Proper ventilation of the darkroom and careful handling of the film are necessary to avoid getting dirt on the film.

Special care must always be taken in all phases of handling undeveloped film. A conscientious and painstaking operator, who will guard not only against the various hazards, but who will also be meticulous about checking and rechecking film and reports, in order to send the proper takes to the laboratory, is, therefore, essential.

Added Safety Factor.—Although certain risks are involved, an important factor of safety is gained as the result of breaking down the negative before development. As was mentioned before, previously to the adoption of this system, all takes of scenes were sent to the laboratory at the same time for development. If a failure should occur in the laboratory, for example, and the negative were stopped in the developer, all takes of a given scene might be damaged. If only one take of a scene is at the laboratory, only that one take can

be damaged. Since usually two or more satisfactory takes are made of a scene, the good takes which have been held at the studio can be developed and printed, and mistakes avoided. This additional factor of safety ordinarily makes it unnecessary to use two recorder heads and to make duplicate sound records on location or at other places where the danger of damage during processing has to be specially guarded against.

Storage of "Out" Takes.—Storage space for the undeveloped film must be provided and the film in the cans must be indexed so as to be readily available. The undeveloped film is ordinarily kept until the picture has been completely edited and shipped.

Reversal and Use of Printing Stock.—When it has been determined that there will be no further call for the rejected, undeveloped takes, they are removed to a splicing room, which is lighted in the same manner as the positive darkroom. Here the notched portions, the identification marks, and the five feet of film preceding and following, that might possibly have been tagged, are cut out. In practice, no take of less than forty feet in length is used. All the other takes are spliced together into continuous, 1000-foot rolls. The rolls are put into cans labeled according to the emulsion numbers on the film. The laboratory, using the portion of the film opposite the part that was originally exposed in recording, makes prints of daily rushes and prints for editing purposes on the reclaimed stock. This procedure was suggested by Mr. J. Wilkinson of RKO Studios.

Splicing Precautions.—Special precautions must be taken in the splicing operations. Here again, the skill and conscientiousness of the film splicer are all-important. He must wear gloves at all times to prevent finger-prints and grease from getting on the film. The gloves must be changed frequently, as they become soiled or wear through from constant contact with the film. A carefully ground emulsion scraping blade must be used on the splicing machine. It must be set exactly in the scraper so that the blade thoroughly scrapes the emulsion from the portion of the film to be spliced and yet does not cut into and weaken the celluloid base. It must scrape cleanly and evenly. To do this effectively, it has been found that if the emulsion is scraped from the center outward in both directions, a better splice is made possible than when the emulsion is scraped off in complete sweeps from side to side. Well prepared contact surfaces and a film cement of high quality assure the

greatest possible strength in the splices. With these precautions, practically no difficulty has been encountered from broken splices.

It has been necessary to make re-prints occasionally when spliced stock has been used, because of fogged spots that have been unnoticed by the splicer. However, less than four per cent of the footage of the prints made on reclaimed spliced stock have to be reprinted for any reason. This percentage is being decreased as various minor difficulties are remedied and eliminated.

Economics Effectuated.—At RKO Studios, laboratory developing charges for sound film have been reduced somewhat more than fifty per cent as a result of processing only selected takes. About ten per cent of the total studio outlay for positive raw stock is saved as a result of using salvaged spliced stock.

Use of System on Predeveloped Camera Negative.—Warner Bros.-First National Studios have been breaking down predeveloped picture negative for several years. The system was adopted there, not primarily as an economy measure, but at a time when the laboratory facilities were not adequate to develop all negative. The situation was met by developing only the good and usable takes. The procedure followed there, with certain exceptions, is similar to that of the RKO Studios on predeveloped sound negative.

Exposure test strips are made each time photographic conditions are changed. While in the camera, the negative is notched at the end of each exposure strip and between takes. Reports are made listing the "selected," the "hold" and the "NC" takes. "Selected" takes are those from which prints are to be made immediately. "Hold" takes are those that are deemed usable, but not ordered to be printed. The "NC" takes are those that probably will not be used.

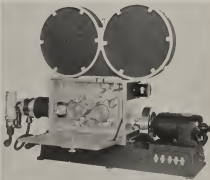
Camera takes are identified by photographing a slate bearing the scene and take numbers instead of by punching these numbers on the film, as is done with sound negative. The photographed identification is invaluable, of course, until after the film has been developed.

The person separating the undeveloped takes into their proper classes must work in almost complete darkness. His only source of illumination is a small flashlight, which makes it possible for him to read the tickets classifying the various takes. Knowing the number of takes and tests on a roll of film, the operator, by counting notches, can separate the takes and the tests that go with them into their proper classes.

The "selected" and "hold" takes are developed. The "NC" takes are put into cans and held until the picture has been edited and shipped.

The hazards that are present while working with undeveloped sound track

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Continued on page 200

are greater when working with undeveloped picture negative because the risk of fogging is greater and because the area covered by picture, and consequently subject to damage, is larger than the area covered by sound track. The precautions previously suggested in connection with sound negative should, accordingly, be more painstakingly observed when working with picture negative.

Mr. Fred Gage, in charge of Warner Bros.-First National Laboratories, who furnished this information on the breakdown of predeveloped camera negative, reports that delays and difficulties encountered are negligible and that the savings effected justify the use of the system.

Since the picture covers the greater part of the film, camera negative, unlike sound negative, once exposed, can not be used again. As a consequence, the only saving resulting from breaking down the camera negative before development is the cost of the laboratory processing of the film that is not developed.

At the RKO Studios, a semi-automatic film notching device that may be attached directly to the camera or to the sound recording head is being developed by Mr. T. Winchester. This device will simplify and make possible faster notching of film.

Conclusion.—Faced with the necessity of decreasing the costs of production, the studios have sought economies in every phase of their work. The methods described in this paper are helping to reduce costs without detriment to the quality of the finished product.

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August 1, 1953

1,920,389 Film Driving Apparatus. Charles L. Hensler, Schenectady, N. Y., assignor to General Electric Company. In apparatus for recording sound on a film and for reproducing sound from a record film including a sprocket and a drum arranged to engage a film at spaced points thereof, means for regulating the speed of the drum in accordance with the speed of the film as moved by the sprocket, including a brake and a controlling member therefor movable in response to changes in the length of the film between the sprocket and drum and having a mass operative to maintain the controlling member in contact with the film and to control the pressure applied by the brake, the mass of said member serving to render the brake substantially unresponsive to sudden small variations in the speed of the film.

August 5, 1953

1,921,037 Sound Recording. Kenneth F. Morgan, Los Angeles, Calif., assignor to Electrical Research Products, Inc., New York, N. Y. The method of recording sound which comprises moving a photographic medium at uniform speed through a beam of light of constant intensity, varying the mean time of exposure of said medium to said beam directly with the envelope of the volume variations of sound recorded and causing virtually complete modulation of the light from said beam falling on said medium for all volumes of sound recorded.

1,921,404 Continuous Film Processing Machine. James Crabtree, Chatham, N. J., assignor to Bell Telephone Laboratories, Inc., New York, N. Y. The combination with the developing chamber of a continuous film processing machine having means for guiding and moving a photographic film, of means for eliminating directional effect in the developing of said film, said means comprising a plurality of wiping units secured to said chamber along the path of travel of said film at an angle to the longitudinal axis thereof.

1,921,469 Film Editing Machine. John J. Kuhn, Elizabeth, and Roy V. Terry, Montclair, N. J., assignors to Bell Telephone Laboratories, Inc., New York, N. Y. In a film editing machine, a hinging unit having a single hinge pin, a film viewing lens, a lens mounting hinged to said pin, a mask for said lens having an aperture through which the film may be edited also hinged to said pin, a film guide, a pad for holding said film firmly in said guide, means whereby said lens,

mask and pad may be variably positioned with relation to said guide and film, means including said hinging unit whereby the lens and mounting may be raised away from said mask for marking a picture as framed by said mask and means including said hinging unit whereby said lens mounting and mask may be raised as a unit away from said guide and film.

1,921,954 Motion Picture and Sound Record Film. Donald H. Stewart, Rochester, N. Y., assignor to Eastman Kodak Company, Rochester, N. Y. In the art of reproduction of sound from photographic records, the method of reducing objectionable sound effects at the point of change-over from one accompaniment to another on the same continuous record which comprises applying to the sound record adjacent the point of change-over a layer which progressively increases the density of the record.

1,921,963 Fade-In and Fade-Out for Motion Picture Film Sound Record. John I. Crabtree, Rochester, N. Y., assignor to Eastman Kodak Company, Rochester, N. Y. In the art of sound photography, the method of reducing the objectionable sound effect at the change-over from the piece of sound record to another which comprises obscuring part of the sound record at the change-over point by applying a piece of opaque, flexible material.

1,921,964 Motion Picture and Sound Record Film. John I. Crabtree and Charles E. Ives, Rochester, N. Y., assignors to Eastman Kodak Company, Rochester, N. Y. The combination with a spliced motion picture film having thereon two areas bearing photographic sound records joined together at their ends, of a transition piece attached in superimposed relation over the junction of the two sound records, said transition piece having an extension joined to the main portion thereof by a weakened connection.

August 15, 1953

1,922,742 Cinematographic Apparatus. George A. Mitchell, Palms, Calif., assignor to Mitchell Camera Corporation, West Hollywood, Calif. In combination with motion picture apparatus having an aperture, means for holding the four marginal portions of a film picture area in said aperture substantially in the plane thereof, and crowned roller means for slightly bowing said area of the film in two dimensions, said roller means being behind the film to bow said area toward the aperture.

August 22, 1953

1,923,746 Modification of Sound Records. Ray J. Pomeroy, Los Angeles, California. The method of producing volume-modified sound records, that includes: subdubly reproducing sound from a record to be modified, artificially modifying the volume characteristics of the

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sound by reference to the sound as it is reproduced, simultaneously making a record of the artificial modifications imposed, and modifying the original record by means of said record of volume modifications.

1,923,757 Sound Recording System: Harold C. Silent, Hollywood, Calif., assigner to Electrical Research Products, Inc., New York, N. Y. In combination, a source of modulated waves, a photographic medium moved at constant speed, a source of light, means for controlling the light from said source incident on said medium, a resistor in series with said control means, means for supplying modulated waves from said source to said control means comprising a transformer having a tapped secondary winding, one portion of which is connected to said control means and the other portion to said resistor, a source of unidirectional current connected between said tap of said secondary winding and the junction of said control means and

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This booklet will undoubtedly prove of great value to those owning the candid and who do their own developing and printing.

Barleben is considered one of the foremost authorities on this type of picture making and his opinion is valued by all who do things photographically.

said resistor, and a control circuit comprising a detector energized by waves from said source to vary the unidirectional current from said source in accordance with the amplitude variations of said waves.

1,923,987 Cinematographic Apparatus: Benjamin Elian Luboshes, Harrow, England. A cinematographic camera comprising in combination a plurality of lenses arranged in ring formation around a common axis, means for directing their optical axes radially outwards from a view-point direction substantially parallel to said common axis, a continuous circular film track around said lenses, a film claw for each lens, a shutter adapted to close and open each lens in turn, means for continuously oscillating the film claws and means synchronized with said shutter for bringing each film claw successively into operative engagement with the film whilst the corresponding lens is closed by the shutter.

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